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Skeptical Inquirer

Vol. 45, No. 6 | Nov./Dec. 2021

THE MAGAZINE FOR SCIENCE

HYPED HOLLYWOOD HORRORS

A Closer Look at *The Entity* and *The Exorcist*

Witch Craze in Carolina

Psychology of Vaccine Hesitancy

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The Skeptical Inquirer (ISSN 0194-6730) is published bimonthly by the Center for Inquiry in association with the Committee for Skeptical Inquiry, P.O. Box 703, Amherst, NY 14226. Printed in U.S.A. Periodicals postage paid at Buffalo, NY, and at additional mailing offices. Subscription prices: one year (six issues), $35; two years, $60; three years, $84; single issue, $5.99. Canadian and foreign orders: Payment in U.S. funds drawn on a U.S. bank must accompany orders; please add US$10 per year for shipping. Canadian and foreign customers are encouraged to use Visa or Master Card.

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[FROM THE DEPUTY EDITOR

Hyped Hollywood Horrors (and Real Ones as Well)

Skeptical sniffing at the seeming silliness of lowbrow topics such as Bigfoot, UFOs, or conspiracy theories is neither wise nor productive. When the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP) was first formed in 1976, its mission was partly to combat popular culture myths such as astrology, psychics, and UFOs. Whether skeptics and scholars like it or not, popular culture is a main driver of public belief—and ignoring topics such as ghosts, QAnon, and psychics doesn't make them go away.

Horror films are no exception, and they influence public beliefs about ghosts and the paranormal. From classics including *The Exorcist*, *The Amityville Horror*, and *The Entity* to more modern franchises such as the *Conjuring* films (which have rehabilitated the tarnished reputations of Ed and Lorraine Warren, notorious for exploiting frightened homeowners), there is no shortage of "true" ghost stories: see, for example, Joe Nickell's "The Conjuring: Ghosts? Poltergeist? Demons?" in the March/April 2014 Skeptical Inquirer; my article "Reel or Real? The Truth Behind Two Hollywood Ghost Stories" in the March 2005 *Skeptical Briefs*; Scott Stine's article "The Snuff Film: The Making of an Urban Legend" in the May/June 1999 SI; and Brett Taylor's "Hollywood Curse Legends" in the November/December 2017 SI.

In our special section on Hyped Hollywood Horrors in this issue, Kenny Biddle and JD Sword join me in shedding some skeptical light on the allegedly true stories behind two high-profile films, *The Exorcist* (1973) and *The Entity* (1982), both based on sensational 1970s bestsellers. The true events that (loosely) inspired William Peter Blatty to write *The Exorcist* have long been known, though the identity of the real, supposedly possessed boy has only recently been made public. Sword gives an overview of the case and reveals who the boy was and what became of him (hint: think scientist, not serial killer). The true events that served as the basis for *The Entity*, on the other hand, have been relegated to relative—and curious—obscurity. I discovered some reasons for that in the course of my research into the case, and in his article Biddle brings his photographic expertise and investigative acumen to bear on the "best evidence" in the case.

Not all horrors are hyped, however. In this issue, we also have an article by Kirk Mishrell on an all-too-real incident from 1792 (a century *after* Salem) when a witch panic gripped a rural South Carolina town. Claims of witchcraft and paranormal events led to three people being tortured and burned as witches. Mishrell uncovers this chilling, overlooked case and offers explanations for what might have led to the panic. The fact that this happened over two centuries ago should bring little comfort; witchcraft accusations—resulting in banishment, attacks, and even murder—continue today in many regions, including Brazil, West Africa, and India. There is much to do, and evil isn't confined to the silver screen.

—Benjamin Radford, Deputy Editor

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Evolution Accepted by Majority of Americans at Last

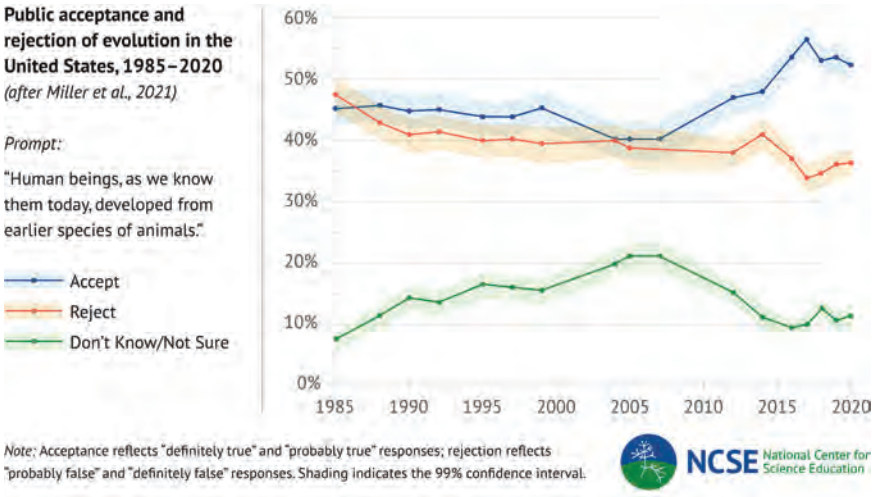
Glenn Branch

The level of public acceptance of evolution in the United States is now solidly above the halfway mark, according to a new study based on a series of national public opinion surveys conducted over the past thirty-five years. "From 1985 to 2010, there was a statistical dead heat between acceptance and rejection of evolution," commented lead researcher Jon D. Miller of the Institute for Social Research at the University of Michigan. "But acceptance then surged, becoming the majority position in 2016."

In these surveys, American adults in representative national samples were asked whether they accepted, rejected, or didn't know (or weren't sure) about the statement "Human beings, as we know them today, developed from earlier species of animals." From 1985 to 2007, the respondents were in effect evenly divided between acceptance and rejection of evolution. Although acceptance enjoyed a slight lead for all these years except 1985, its lead was not statistically significant except in 1999.

From 2012 to 2020, however, acceptance of evolution was consistently, and statistically significantly, in the lead—and over the past five years, in the majority. In 2020, the most recent year of data available, 52 percent of respondents accepted evolution while only 36 percent rejected it. The scientific community's level of acceptance of evolution is upward of 98 percent, according to a 2015 survey by the Pew Research Center, so there remains a substantial discrepancy—but the progress is nevertheless encouraging.

What factors are responsible for the increase in the acceptance of evolution? In their study, Miller and his collaborators identified aspects of education—taking college courses in science, having a college degree, and possessing civic science literacy—as the strongest factors promoting the acceptance of evolution. Improvements with regard to these factors—the proportion of Americans with a college degree almost doubled between 1988 and 2018, for example—thus result in improvements in the acceptance of evolution.



A particularly important route for such improvement is through the preparation of public school teachers. A pair of recent studies by researchers at the National Center for Science Education and Pennsylvania State University found, in analyzing data from a nationally representative survey conducted in 2019, that high school biology teachers and middle school science teachers were both more likely to teach evolution as a matter of scientific consensus if they had studied evolution at the college level.

The strongest factor obstructing the acceptance of evolution, according to Miller and his collaborators, is religious fundamentalism, unsurprisingly. For the purposes of the study, religious fundamentalism was measured in terms of belief in a personal god who hears prayers, acceptance of a literal reading of the Bible, self-reported frequency of attendance of religious services during a typical week, self-reported frequency of prayer during a typical week, and agreement with the statement "We depend too much on science and not enough on faith."

In 2019, only 32 percent of those who scored highest on the scale of religious fundamentalism accepted evolution, as opposed to 54 percent of the whole sample and 91 percent of those who scored lowest on the scale. But even those who scored highest on the scale of religious fundamentalism are showing a shift toward acceptance of evolution. In 1988, a mere 8 percent of religious fundamentalists accepted evolution. While their total numbers declined slightly in the past decade, approximately 30 percent of Americans are religious fundamentalists as defined in the study.

Antievolutionism remains a political force. The Republican Party often panders to religious fundamentalism, and attitudes toward evolution are politicized as a result. Miller and his collaborators found that 34 percent of conservative Republicans accepted evolution in 2019, as compared to 83 percent of liberal Democrats. There is evidence that the politicization is increasing. In 2009, 54 percent of Republicans and 64 percent of Democrats accepted human evolution, but by 2013, the ten-point gap widened to a twenty-four-point gap, according to the Pew Research Center.

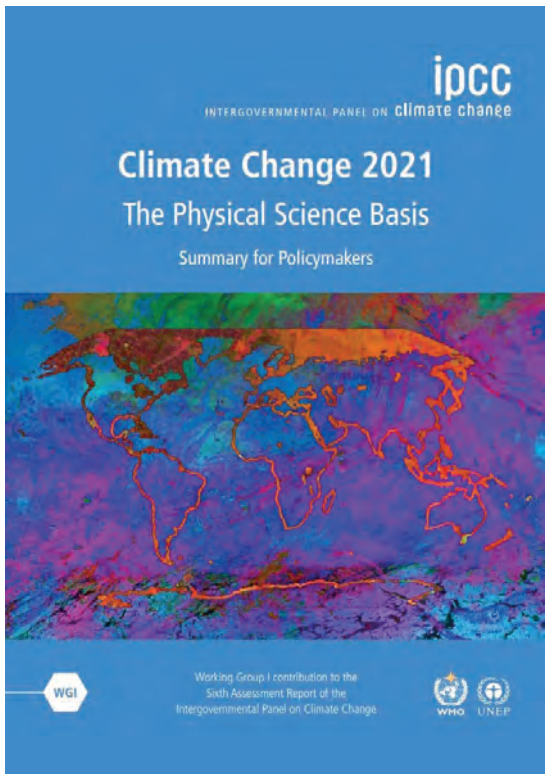
Miller and his collaborators concluded their study by expressing a degree of optimism for the future. Between "the continued growth of educational attainment among American adults in the twenty-first century" and "changes in the religious profile of Americans," such as the increase of nonreligious people and the decrease of inerrantism and related attitudes among religious people, they suggest, "We might expect a moderate rate of growth in the public acceptance of evolution in the United States in the decades ahead."

The study, "Public Acceptance of Evolution in the United States, 1985–2020," was published in the journal *Public Understanding of Science*, a peer-reviewed journal covering all aspects of the interrelationships between science and the public. Besides Miller, the authors are Glenn Branch and Eugenie C. Scott of the National Center for Science Education, Belén Laspra of the University of Oviedo in Spain, Carmelo Polino of the University of Oviedo and Centro REDES in Argentina, and Mark S. Ackerman and Jordan S. Huffaker of the University of Michigan.

Glenn Branch is deputy director of the National Center for Science Education. He received the Evolution Education award for 2020 from the National Association of Biology Teachers.

Eight Takeaways from the IPCC's Latest Report on Earth's Changing Climate

Climate Change 2021, the latest report from the Intergovernmental Panel on Climate Change (IPCC), provides a more clear, precise, and dire view of the Earth's warming climate than the IPCC's most recent previous assessment in 2013. During that time, multiple lines of evidence have led to improved understanding of human influences on the climate, including weather and climate extremes. Beyond the improved scientific understanding, the warming world and increasing number of extreme weather events have become ever more apparent to us all. The effects are already being felt worldwide.



Here are eight key takeaways from the report, issued August 9, and some specific consequences and details (direct quotations unless otherwise indicated).

Main conclusions:

1. It is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere, and biosphere have occurred. (The basic causes are the continually rising greenhouse gas concentrations, mainly carbon dioxide and methane, in the atmosphere, which have risen year by year since 1750.) "The observed increases are unequivocally caused by human activities," the report says.

• Each of the last four decades has been successively warmer than any decade that preceded it since 1850.

• Human influence is very likely the main driver of the global retreat of glaciers since the 1990s and the decrease in Arctic sea ice area between 1979–1988 and 2010–2019. … Human influence very likely contributed to the decrease in Northern Hemisphere spring snow cover since 1950. It is very likely that human influence has contributed to the observed surface melting of the Greenland Ice Sheet over the past two decades.

• It is virtually certain that the global upper ocean (0–700 m) has warmed since the 1970s and extremely likely that human influence is the main driver. It is virtually certain that human-caused CO_2 emissions are the main driver of current global acidification of the surface open ocean.

• Global mean sea level increased by 0.20 meters between 1901 and 2018. The average rate of sea level rise (has steadily increased during that time). Human influence was very likely the main driver of these increases since at least 1971.

2. The scale of recent changes across the climate system as a whole and the present state of many aspects of the climate system are unprecedented over many centuries to many thousands of years.

• In 2019, atmospheric CO_2 concentrations were higher than at any time in at least 2 million years (high confidence),

and concentrations of CH_4 and N_2O were higher than at any time in at least 800,000 years (very high confidence). Since 1750, increases in CO_2 (47%) and CH_4 (156%) concentrations far exceed … the natural multi-millennial changes between glacial and interglacial periods over at least the past 800,000 years (very high confidence).

• Global surface temperature has increased faster since 1970 than in any other fifty-year period over at least the last 2,000 years (high confidence). Temperatures during the most recent decade (2011–2020) exceed those of the most recent multi-century warm period, around 6,500 years ago.

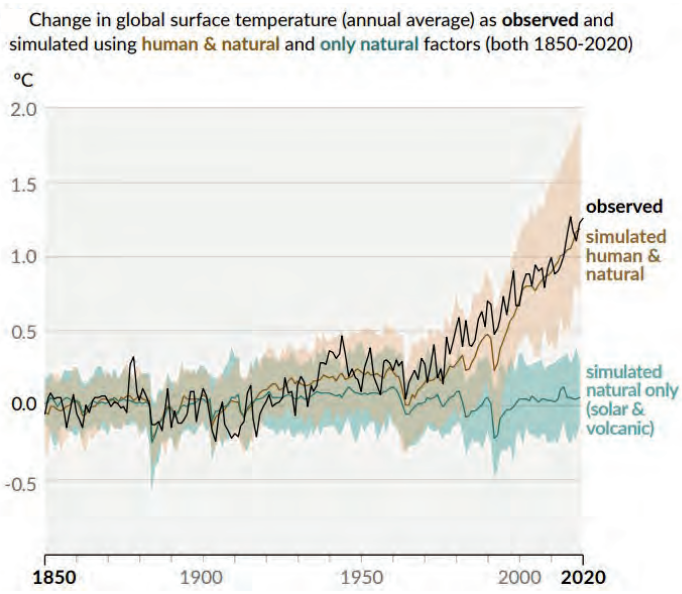
• In 2011–2020, annual average Arctic sea ice area reached its lowest level since at least 1850 (high confidence). Late summer Arctic sea ice area was smaller than at any time in at least the past 1,000 years (medium confidence).

• Global mean sea level has risen faster since 1900 than over any preceding century in at least the last 3,000 years (high confidence). The global ocean has warmed faster over the past century than since the end of the last deglacial transition (around 11,000 years ago) (medium confidence).

3. Human-induced climate change is already affecting many weather and climate extremes in every region across the globe. Evidence of observed changes in extremes such as heat waves, heavy precipitation, droughts, and tropical cyclones, and, in particular, their attribution to human influence, has strengthened since (the 2013 report).

• It is virtually certain that hot extremes (including heat waves) have become more frequent and more intense across most land regions since the 1950s, while cold extremes (including cold waves) have become less frequent and less severe, with high confidence that human-induced climate change is the main driver of these changes. Some recent hot extremes observed over the past decade would have been extremely unlikely to occur without human influence on the climate system.

• The frequency and intensity of heavy precipitation events have increased since the 1950s over most land area for which observational data are sufficient for trend analysis (high confidence), and human-induced climate change is likely the main driver. Human-induced climate change has contributed to increases in agricultural and ecological droughts in some regions due to increased land evapotranspiration.



• Human influence has likely increased the chance of compound extreme events since the 1950s. This includes increases in the frequency of concurrent heat waves and droughts on the global scale (high confidence); fire weather in some regions of all inhabited continents (medium confidence) and compound flooding in some locations (medium confidence).

4. Global surface temperature will continue to increase until at least the mid-century under all emissions scenarios considered. Global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in CO_2 and other greenhouse gas emissions occur in the coming decades.

5. Many changes in the climate system become larger in direct relation to increasing global warming. They include increases in the frequency and intensity of hot extremes, marine heat waves, heavy precipitation, agricultural and ecological droughts in some regions, and proportion of intense tropical cyclones, as well as reductions in Arctic sea ice, snow cover, and permafrost.

With every additional increment of global warming, changes in extremes continue to become larger.

It is very likely that heavy precipitation events will intensify and become more frequent in most regions with additional global warming.

Additional warming is projected to further amplify permafrost thawing, and loss of seasonal snow cover, land ice and Arctic sea ice (high confidence). The Arctic is likely to be practically sea ice free in September at least once before 2050 under the five illustrative scenarios considered in this report.

6. Continued global warming is projected to further intensify the global water cycle, including its variability, global monsoon precipitation, and the severity of wet and dry events.

7. Many changes due to past and future greenhouse gas emissions are irreversible for centuries to millennia, especially changes in the ocean, ice sheets, and global sea level.

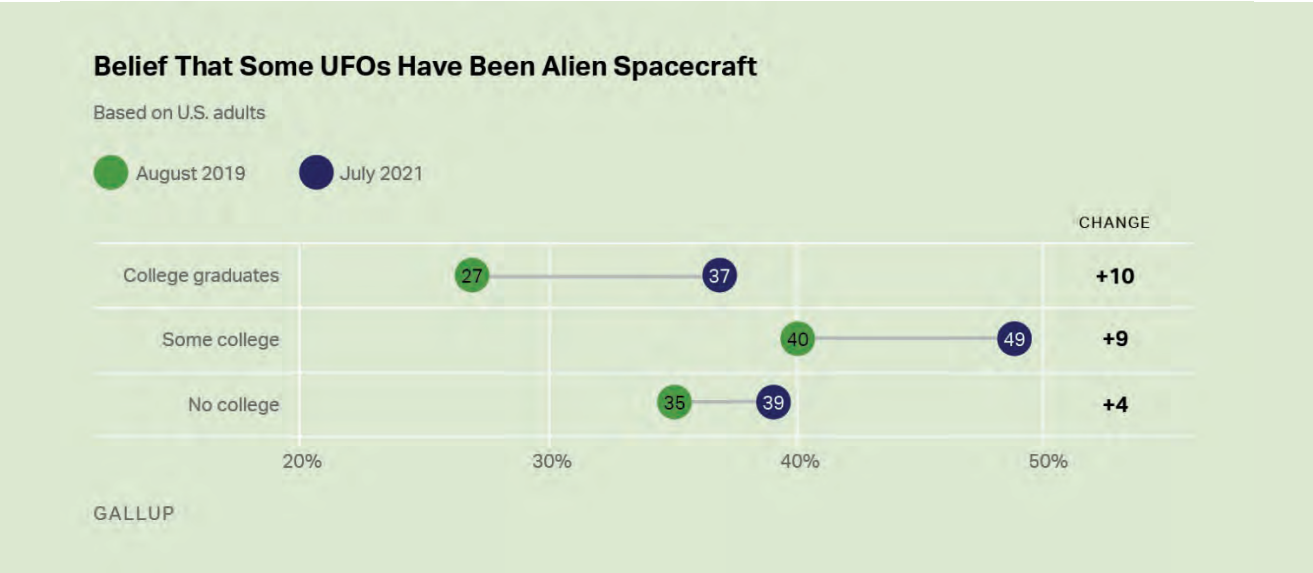
8. Low-likelihood outcomes, such as ice sheet collapse, abrupt ocean circulation changes, some compound extreme events, and warming substantially larger than the assessed very likely range of future warming cannot be ruled out and are part of risk assessment.

Note

These conclusions and statements excerpted from: IPCC, 2021: Summary for Policymakers. In *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge University Press. In Press.

Belief That UFOs Are Alien Spacecraft Rises, Gallup Survey Finds

Kendrick Frazier



Given this year's UFO flap (see the "UFOs Hit the News" special section in our September/October 2021 issue), it is hardly surprising that the latest Gallup Poll shows belief that UFOs involve alien spacecraft from other planets is up markedly from 2019. Nevertheless, half of Americans remain skeptical.

News media throughout the spring and early summer reported a stream of stories promoted by UFO enthusiasts about Navy videos supposedly indicating unusual phenomena. Even though there are many possible natural explanations for the images (as described by CSI Fellow Mick West), their efforts managed to get the Pentagon to issue a report in June. All this generated still more media interest.

The eventual nine-page report, "Preliminary Assessment: Unidentified Aerial Phenomena," issued June 25 by the Office of the Director of National Intelligence, said the various incidents likely fall into five categories: "airborne clutter, natural atmospheric phenomena, U.S. government or U.S. industry development programs, foreign adversary systems, and a catchall 'other' bin." It made no mention of aliens, extraterrestrials, or even "UFOs" (preferring the term *UAP*).

But it is clear a certain segment of the American population prefers to jump to the conclusion that something temporarily unidentified in the sky—even when the image quality is poor or out of focus—is evidence of aliens.

The new Gallup Poll, based on a telephone poll of 1,007 adults conducted July 6–21 and issued August 20, asked this question: "Which comes closer to your view—some UFOs have been alien spacecraft visiting earth from other planets or galaxies, (or) all UFO sightings can be explained by human activity on Earth or natural phenomenon [*sic*]?"

In 2019, a similar Gallup Poll found that 33 percent answered that some have been alien spacecraft; in the 2021 poll, that number increased to 41 percent. Those who answered that all could be explained by human activity and natural phenomena dropped from 60 percent to 50 percent. Perhaps it is still comforting that, as Gallup therefore notes, "Half of Americans continue to presume there is an Earth-based explanation for all such sightings."

The poll notes that the new survey comes shortly after a "period when UFOs have received significant coverage in mainstream news publication." The same was true in August 2019, just after the first U.S. Navy videos were leaked. Skeptics have noted that much of that coverage, then and now, has been uncritical and credulous.

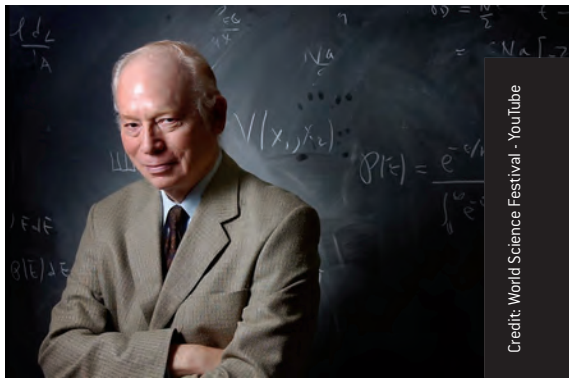
A few other points Gallup offered:

Belief that the answer is aliens rose among college graduates (37 percent in the new poll, 27 percent in 2019), men (44 percent now, 34 percent in 2019), and middle-age adults (45 percent vs. 32 percent in 2019). Adults fifty-five years and older are more likely than younger adults to be skeptical. Women's belief rose only from 34 percent to 38 percent. There were no significant differences from the national average in the views of white and non-white adults as well as Republicans and Democrats.

Kendrick Frazier is editor of the Skeptical Inquirer.

Nobel Laureate Theoretical Physicist Steven Weinberg Dies at 88

Manfred Cuntz and Andrew P. White


Credit: World Science Festival - YouTube

Steven Weinberg, an American theoretical physicist, Nobel laureate (1979), and member of the faculty at the University of Texas at Austin (UT Austin) died on July 23, 2021, at the age of eighty-eight. Weinberg was a highly regarded scientist with principal contributions to astrophysics and high energy physics throughout his career. He was honored through numerous other prizes and had been elected to the National Academy of Sciences and Britain's Royal Society. Besides his pivotal work in physics, Weinberg was also focused on education and public engagements. Weinberg was elected a fellow of the Committee for Skeptical Inquiry (then CSICOP) in 1995.

Weinberg's fundamental contribution to science was bridging the gap between astrophysics and high energy physics, historically two separate fields of physics. He was able to do so both at the level of public outreach—making his work accessible to lay people and experts alike—and cutting-edge science. Regarding the former, one of his contributions was the popular science book *The First Three Minutes: A Modern View of the Origin of the Universe*, published in 1977. The book was well received by the general public and was also readily used as an introductory text for university students. A more recent piece, published in 2015, is the science history book *To Explain the World: The Discovery of Modern Science*, which attracted both interest and controversy.

At the professional level, Weinberg's work developing the intersection between astrophysics and high energy physics has been of critical importance for the advancement of science, including numerous NASA space missions such as the Cosmic Background Explorer (COBE) and the Wilkinson Microwave Anisotropy Probe (WMAP). These missions carefully examined the cosmic microwave background and probed the geometry of space on large scales. Another mission, Planck, led by the European Space Agency (with notable contributions by NASA) operated between 2009 and 2013. Planck allowed making the most accurate maps of the microwave background at the time; its instruments were sensitive to temperature variations of a few millionths of a degree. Associated theoretical research has the potential to help unravel the physics of the Big Bang as well as cater to fervent topics such as, for example, whether there had been any physics prior to the Big Bang or whether asking this question is fundamentally meaningless.

Steven Weinberg was also a true intellectual giant in the world of high energy particle physics. His paper "A Model of Leptons," in 1967, laid out the basis for the unification of electromagnetic and weak nuclear interactions. Subsequently, this theory became a fundamental element of the Standard Model of particle physics for which Weinberg was awarded the 1979 Nobel Prize in Physics together with Sheldon Glashow and Abdus Salam. The discoveries of the W-boson, the Z-boson, and more recently the Higgs boson provide strong vindication of the correctness of this theory.

The Standard Model, with the addition of the strong nuclear interaction to electromagnetic and weak forces, has become incredibly successful in correctly predicting a huge range of phenomena in particle physics. Weinberg's contribution to this success will always be regarded as one of the most important of the modern scientific era. However, Weinberg also realized that the Standard Model was incomplete through, for example, its inability to explain the nature of dark matter. To extend the current theory, Weinberg was well known for his studies of areas such as string theory and supersymmetry.

Weinberg was outspoken and did not mind voicing his opinion on subjects such as religion, Israel, guns in the classroom, and football. He was highly critical of organized religion and a vehement supporter of Israel, a position that entailed some discomfort in segments of the general public supportive of the Palestinian cause. In 2016, he did not shy away from being opposed to a new law that allowed the carrying of concealed guns in the classrooms of UT Austin.

There is also a popular anecdote about football: according to multiple sources, upon his arrival at UT Austin he wanted his salary contractually linked to that of the head football coach. It's not clear whether this demand was granted (but we assume almost certainly it was *not*). Obviously, Weinberg's request may be interpreted in two ways. First, he wanted to secure a significant salary in support of his seminal work. Second, he wanted to draw attention to the exaggerated importance of sports (especially football) on U.S. campuses, a notable anomaly compared to standard university practices around the globe.

Weinberg's achievements will stand as a major inspiration for future generations of physicists seeking a more complete understanding of the natural universe. He will also be missed for his profound contributions to the public arena, encompassing science philosophy, education, and the intersection between science and politics, including the thriving debate on climate change.

Manfred Cuntz and Andrew P. White are professors in the Physics Department at the University of Texas at Arlington.

Tom Flynn, Giant of American Freethought, Dies at 66

The world has lost a towering figure of American freethought, a man who was both on the cutting edge of secular humanist thought as well as the foremost caretaker of its rich history. The entire Center for Inquiry (CFI) family is anguished by the sudden and unexpected death of our colleague, teacher, and friend Tom Flynn. He died at his home in Williamsville, New York, outside of Buffalo, on August 23, 2021. He was only sixty-six.

Flynn held numerous leadership roles during his more than thirty years with CFI. Most prominently he was editor of *Free Inquiry*, "America's bimonthly journal of humanist ideas," a sister publication to the Skeptical Inquirer dealing with reason and humanity. Its current issue at the time of his death featured articles on Christian nationalism and on the State of the Planet, plus Flynn's own op-ed, "Will World Population Drop Far Enough, Fast Enough?" He wrote such thoughtful op-eds, editorials, reviews, and feature articles in virtually every issue of *Free Inquiry*.

Flynn was also former executive director of the Council for Secular Humanism, which copublishes *Free Inquiry* in conjunction with CFI and advances the cause of humanism worldwide. He was also active as director of the Robert Green Ingersoll Birthplace Museum and the Freethought Trail. He was the editor of *The New Encyclopedia of Unbelief*, a nearly 900-page volume published by Prometheus Books in 2007 with contributions from eighty-five global experts. Richard Dawkins wrote the foreword.

But this collection of titles does not nearly convey the plainer truth, which is that Tom Flynn was the beating heart of the Center for Inquiry and indeed the wider freethought movement. He was a strong presence in almost every CFI activity, including most CSICon conferences in recent years.

A stark rationalist and staunch atheist if ever there was one, Flynn was nonetheless brimming with enthusiasm, curiosity, bold ideas, and, perhaps most of all, humor. He had a deep love and encyclopedic knowledge of freethought history and devoted himself to the preservation and rediscovery of American freethought's great untold stories.

At the same time, he was a true visionary whose future-focused ideas about religion, atheism, equality, and the existential crises we face as a global civilization were once considered radical but now seem prescient. He was a virtuoso of the written word, penning not only countless articles and essays but also science fiction novels (he'd just announced on Facebook on August 20 that his third science fiction novel, *Behold, He Said*, was back in print, "well, virtual print") and the defiantly revelatory book *The Trouble with Christmas*.

Flynn reveled in his various public personas, whether as a pugnacious stoker of controversy, a stubborn atheist curmudgeon (as with his infamous "Anti-Claus" alter-ego), or a wisecracking, avuncular coworker. But at his core, Flynn was a man excited about big ideas, regardless of their popularity or public acceptance, and he was eager to share those ideas, bringing to them his unmatched combination of scholarship, eloquence, and humor.

"Tom didn't believe in magic, but he was magical," said Robyn E. Blumner, president and CEO of the Center for Inquiry. "How else to describe this unlikely combination of brilliance, charm, vision, and roll-up-your-sleeves accomplishment?"

"He saved the legacy of the Great Agnostic, Robert Green Ingersoll, from obscurity. He carried the torch for atheism, secular humanism, and clear-eyed rationality for decades with his powerful and copious writings and speeches—undoubtedly helping to cause the Rise of the Nones. All while cracking jokes and delighting everyone in his orbit," said Blumner. "And how lucky we were to be part of it."

"The death of Tom Flynn is a tragedy of epic proportions for everyone who cares about the equality of atheists anywhere in the world," said Edward Tabash, veteran freethought activist and chair of CFI. "He was our conscience against religious bigotry. He was our conscience against irrational action and thought."

"His razor-sharp humor and wit were simply unmatched," said Tabash. "The best way that we can honor Tom's memory and all the magnificent work that he did is to continue to devote ourselves to ending religious bigotry anywhere and everywhere."

To Flynn's wife, Sue, and to his family and friends, all of us at the Center for Inquiry join you in your grief. He was our family, too.

Flynn's hero, Robert Green Ingersoll, once wrote, "A great man does not seek applause or place; he seeks for truth; he seeks the road to happiness, and what he ascertains, he gives to others." It will be a long time before there can ever be a full accounting of what Tom Flynn gave to all of us. Now Flynn joins Ingersoll in what the Great Agnostic called "the perfect rest," no longer as a mere admirer but as an equal.

An archive of Flynn's articles for *Free Inquiry* (1985–2021) is online at https://secularhumanism.org/authors/tom-flynn/. The December 2021/January 2022 issue of *Free Inquiry* will feature tributes and memorials to Tom Flynn.

Bringing Skepticism to the Brazilian Senate

NATALIA PASTERNAK AND CARLOS ORSI

With an admittedly grossly underestimated death toll of more than half a million, Brazil is one of the countries hardest hit by the COVID-19 pandemic. It is also one in which the catastrophic effects of the SARS-CoV-2 virus can be attributed, with little space for controversy, to the adoption of public policies based on pseudoscience and disregard of sound scientific advice.

President Jair Bolsonaro, elected to office in 2018 and in power since 2019, not only strong-armed the Ministry of Health into promoting false "cures" and "preventives" for the disease—including hydroxychloroquine, ivermectin, and vitamin D—but used the prestige of his office and the visibility of his public persona to deride the use of masks and the need for social distancing and even to smear vaccines (in one of his speeches he joked that "unproven" vaccines could "turn you into an alligator"). He even threatened to mobilize the army against state governors who tried to impose strict lockdowns.

Finally, in April 2021, after a lot of backstage compromising and negotiation, the opposition to the president in the Brazilian Senate got around to establishing a Parliamentary Inquest Committee ("CPI" is the acronym in Portuguese) on the handling of the pandemic by the federal government. The senators in the Inquest Committee will underwrite a final report that might offer grounds for criminal prosecution and/or impeachment of the president.

Recent developments in the CPI include the arrest of a former officer of the Ministry of Health for lying under oath in testimony before the Senate and the revelation that some of Bolsonaro's supporters were trying to extract bribes from vaccine manufactures, including AstraZeneca.

Be that as it may, science denial and a fierce disposition to attack science and scientists and to promote unproved and unplausible "cures" for COVID-19 still make up much of the federal government's (and Bolsonaro's) response to the pandemic. Because of that, one of us, CSI Fellow and President of Instituto Questão de Ciência Natalia Pasternak, was called to testify at the CPI.

Due to her background in microbiology and long experience communicating science to large audiences—be it online, in books, or in lectures—Pasternak saw herself in high demand by the Brazilian news media as soon as the pandemic hit. But due to the government's actions and words, she saw herself talking less and less on the specifics of the virus and the disease and more and more on the value of science in general, on the need for skepticism when faced with "miracle" cures, and on the irresponsibility and foolishness of adopting public health policies that ignore scientific evidence. It was as a skeptic and science communicator—much more than as a specialist in microscopic critters—that she appeared before the Senate on June 11.

Bringing skepticism and scientific thinking to Brazil's Senate, during an investigation followed by millions of people on YouTube, was a lifetime opportunity. Our major goal as leaders of the skeptic movement in Brazil has always been to bring science and rationality to the public debate. Speaking at the Senate, and explaining science to policy makers, was not only a recognition of our work but our chance to help the members of parliament understand the

Editorial credit: Photocarioca / Shutterstock.com

Natalia Pasternak

dangers of promoting pseudoscience as public policies.

Pasternak spoke of how science works, the difference between correlation and causation, how clinical trials are run, what conclusions can be inferred from "in vitro" studies and animal models, the fallacies most commonly used by pseudoscience promoters—so well known by skeptics all over the world—such as anecdotal evidence and confounding factors, cherry picking of data, and, of course, the "garbage in-garbage out" method of meta-analyses. Also supporting science in front of the Senate was Claudio Maierovitch, former president of Brazil's drug regulatory agency Anvisa, who was also heard as an expert witness.

Among the many miracle cures promoted by the federal government during the pandemic, hydroxychloroquine (HCQ) was certainly the most potentially harmful and infamous, because it was the president's pet treatment. Bolsonaro claimed he was cured by HCQ. A picture of Bolsonaro with a box of the medication in hand, chasing after an emu at the presidential palace in Brasilia, became an online hit. Pasternak even took advantage of this vaudeville moment to explain how animal models showed that HCQ had no effect on COVID-19 prevention or treatment, even when used as "early treatment," which was encouraged by its defenders.

Using a slide presentation, she showed how "in vitro" assays can be misleading and must be confirmed by animal models and, if those bring positive results, by human clinical trials. HCQ was tried in mouse and nonhuman primate models against COVID-19 and didn't work. Pasternak explained that it could even have been tested in emus, but they were smart and kept running away!

Next came the explanation of how human clinical trials were conducted for HCQ and COVID-19 and how the best available evidence makes it very clear that this treatment should not be recommended. Finally, she showed why personal stories and confounding factors can lead to the impression that it works, but we can weed out such misconceptions with skepticism and scientific thinking.

For the most part, the deposition was well received. Senator Marcos Rogerio anti-Semitically demanded why Pasternak dared to sign a manifesto of Jewish intellectuals against Bolsonaro, and Senator Luis Carlos Heinze asked her what her "H-index" was (compared to HCQ promoter Didier Raoult). Other than that, there was hardly any scientific argument—or any argument at all—during her presentation.

Pasternak replied to both senators firmly, stating that it was her right as a citizen and a member of the Brazilian Jewish community to sign whatever she deemed right in a democratic country. She also explained that the H-index is an imperfect metric used to evaluate academic achievement, and although she has a strong background as a lab scientist, she no longer works as an academic. Therefore, most of her work can be found in books and newspapers, communicating science directly to the public.

Four days later, the attacks began. Senator Luis Carlos Heinze accused Pasternak of using irony to debunk his claims that HCQ works—yes, it took him ninety-six hours to realize it—and he blatantly lied, saying that she had never published academic papers in her entire career. Other congresspeople who support the government joined in. Our favorite accusation was: "Natalia Pasternak is not a medical doctor; she never treated a single patient." It's not clear what could be wrong with this statement: Because she is not a medical doctor, and never claimed to be, isn't it a *good thing* that she doesn't treat patients? Whenever purely medical questions were asked, she would defer to her colleague Dr. Maierovitch, who is in fact a medical doctor.

It comes as no surprise to us that the attacks on Pasternak's participation at the CPI were personal and offensive. When it is impossible to argue with the facts, the messenger becomes the target. After two years running the only Brazilian NGO for the promotion of skepticism and critical thinking, we are used to this approach. And the senators and other congresspeople should have learned already that we are not easily intimidated. The investigation continues, and, hopefully, by the end of the CPI Brazilians will have realized what happens when a denialist is voted into office—and will get rid of him.

The pandemic in Brazil has killed more than a half million people mainly because the federal government has denied and disregarded scientific evidence. We hope it serves as an example, for our country and the world, never to be repeated. ■

Natalia Pasternak is a microbiologist, CSI fellow, president of Instituto Questão de Ciência, and visiting scholar at Columbia University.

Carlos Orsi is a journalist and writer, director of Instituto Questão de Ciência, and chief editor of *Revista Questão de Ciência*.

THE BENEFITS OF A CHARITABLE BEQUEST

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[POSTCARDS FROM REALITY

ROBYN E. BLUMNER

Robyn E. Blumner is president and CEO of the Center for Inquiry and executive director of the Richard Dawkins Foundation for Reason & Science. She is a lawyer who previously held posts as a syndicated columnist and editorial writer at the *Tampa Bay Times* and as executive director of the ACLU of Florida and ACLU of Utah.

Why Full of Bull? Here's Why.

This is the first of a new regular column.—Eds.

Rudy Giuliani is full of bull. Whether he is promoting bogus cures for COVID-19 or spreading the Big Lie about election fraud, the disgraced former mayor seems to delight in "throwing a fake"—his preferred phrase for dishonesty in the political arena.

Giuliani seems to think that all's fair when it comes to exploiting people's fears and gullibility, even when our democracy is at stake and the public's health is at risk. This makes Giuliani a full-of-bull stand-out even during a year when lies, conspiracies, and quackery were coming so fast and so thick from so many quarters that it gave those of us in the reality-based world whiplash.

But don't just take my word for it. Ask the thousands of people who responded to the Center for Inquiry's first Full of Bull award competition. Giuliani was the frontrunner out of the gate and ended up with a whopping 41.7 percent of the vote. He easily out-bulled his closest competitor, InfoWars founder and master of wrong Alex Jones, who received 28.7 percent of the vote.

Coming up behind Giuliani and Jones in the misinformation Olympics were Christian Right princeling Jerry Falwell Jr.; anti-vaxxer extraordinaire Robert F. Kennedy Jr.; Goop crapola seller Gwyneth Paltrow; and talker to the dead for coin Thomas John.

It was quite a contest. And in my mind, each one was a winner in his or her own way.

Why did the Center for Inquiry (CFI) do this? Well, to be honest, it was a marketing effort. While CFI and its subparts—including the Committee for Skeptical Inquiry—do a massive amount of good, people don't know who we are. To grow, we need more people aboard the skepticism train under our banner. And by holding a spotlight up to some of the worst agents of lies, deception, conspiracies, and misinformation, we hoped to generate some buzzy interest in our work.

It worked well enough that we plan to hold the Full of Bull contest annually, each year with a rogue's gallery of nominees for the public to choose from. Just having these nominees next to one another was a way to connect the dots for CFI. What do Jerry Falwell Jr. and Gwyneth Paltrow have in common? Certainly not their politics. Nothing ap-

parent, frankly—unless you live in CFI's world. That's where the similarities are glaringly obvious. They both pander dangerous nonsense that gives people false hope and lures them into parting with their hard-earned money.

Before being pressured to resign as president of Liberty University due to sex scandals, Jerry Falwell Jr. offered students an expensive education in such valuable disciplines as creation science taught by a young-earth creationist professor at its Center for Creation Studies.

All I can say is it's a good thing it doesn't have a medical school. Imagine the required coursework: Antibiotics or Thoughts and Prayers 101. And my personal favorite: Medical Apologetics 201: Why God hates amputees? Biblical reasons HE never regenerates a limb.

Actually, I take it back, Liberty University *does* have a medical school of sorts: It has its own College of Osteopathic Medicine that graduated its first class in 2018. "Would you like some snake handling to go with the snake oil I'm prescribing?"

No better is Gwyneth Paltrow and the lifestyle branded absurdities she hoists on womenkind through her New Agey wellness house of Goop. There have been vaginal steams that gynecologists say could cause burns and pricey and worthless "healing" stickers (which I guess are for those burns). And, of course, those famous $66 Jade eggs. Helpfully, the Goop website tells customers to: "Clean your egg after use and before using again. Keep it in or on a space that is sacred to you or has good vibes." What people really want to know is if it's dishwasher safe.

The point for CFI is that Paltrow and Falwell Jr. have quite a bit in common. And they share that commonality with all the hucksters of delusion who are our Full of Bull nominees.

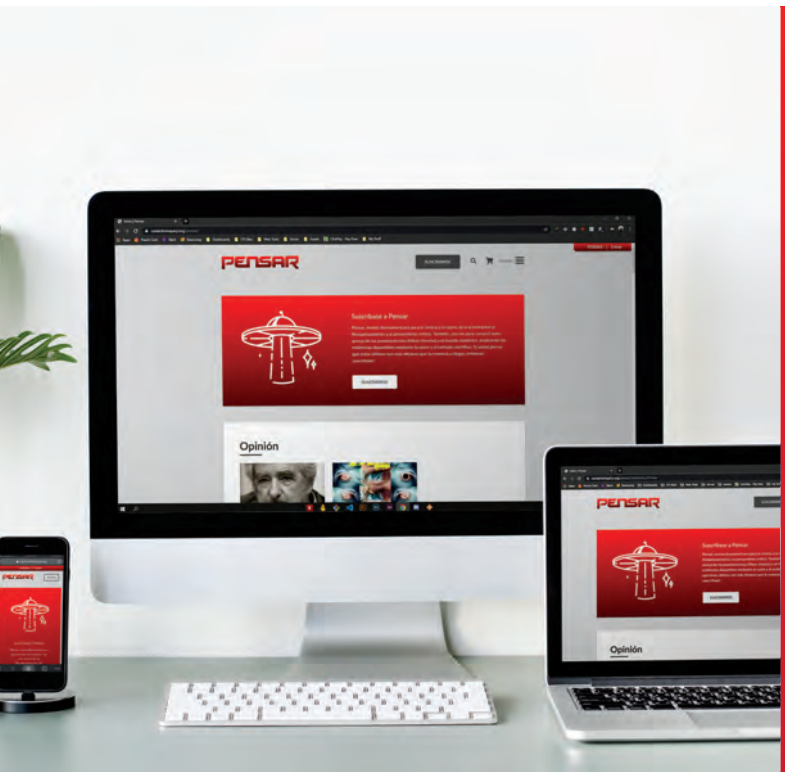
The nominees represent the range of nonsense that CFI combats every day: from people who claim to commune with the dead, to propagators of anti-vax hysteria, to those who feed a willing public the conspiracy *du jour*.

That is the message the Full of Bull campaign is trying to get across. It is all of a piece. They are all high-profile people who float information that is evidence-free, antiscience, irrational in the extreme, and demonstrably harmful. And they not only get away with it but frequently get rich in the process.

Having the public vote each year on who should be named the most Full of Bull is a way to introduce and instill the idea that a con can take many forms and can come from across the political spectrum. But at its core, each con has the same goal: to convince you of something false to serve an ulterior and usually nefarious or exploitative motive.

Rudy Giuliani (photo credit: Gage Skidmore [CC BY-SA 2.0])

Rudy Giuliani calls it "throwing a fake." We call it Full of Bull. And our job is to convince everyone else to simply call it wrong. ■



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[INVESTIGATIVE FILES JOE NICKELL

Joe Nickell, PhD, is CSI's senior research fellow. He is a former Pinkerton detective and author of nearly fifty books, including the police science textbook *Crime Science*.

The 'Impossible' Murder of Julia Wallace

It has been given various descriptors—including "a perfect crime" and "a classic locked-room mystery"—but when I heard of the case and learned that mystery writer Raymond Chandler had designated it an "impossible murder" (Hunt and Thompson 2019, 37), it seemed to have my name written on it. After all, fellow investigative writer Massimo Polidoro once dubbed me "The Detective of the Impossible." At length, I determined to "reopen" the Wallace case.

The whodunit fascinated, among other mystery writers, Dorothy L. Sayers in addition to sparking numerous true-crime articles and books as well as investigative documentaries. It had also made British legal history: It was the first instance—since the Court of Criminal Appeal was established in 1907—in which appellate judges concluded the jury had made a completely wrong decision in a death-penalty case and overturned the conviction (Goodman [1969] 2017, 251).

The Killing

William Herbert Wallace lived with his wife, Julia, in a poor district of Liverpool, England, named Anfield. On the day of her homicide—January 20, 1931—Herbert was a fifty-two-year-old insurance representative and Julia a housewife, her "age believed 52 years" also—according to his signed statement after the murder (Wallace 1931). (But Gannon [2012, 17] cites evidence she was much older.) The two had married somewhat late in life and were childless. Julia was a tal-

ented pianist, and her husband often accompanied her quite amateurishly on the violin while they sang duets (Goodman [1969] 2017, 21–22). He was also a science hobbiest—with a home chemistry lab and microscope—having once been a part-time assistant lecturer in chemistry at the Liverpool Technical College. As well, he was a chess enthusiast (Goodman [1969] 2017, 21–22, 28, 101–102).

On the fateful date—after his day's work, dinner at home with Julia, and then a fruitless attempt to keep an appointment with a prospective client—Wallace arrived again back home. He discovered to his surprise that he was locked out, but when his next-door neighbors, the Johnsons, saw him seemingly perplexed, he tried the back (kitchen) door again. "It opens now," he said. He walked inside but did not see or hear his wife. Oddly, he first went upstairs and looked around, noticing a bed with the covering pulled off (probably just from Julia's housework). He returned to search downstairs and, finally, striking a match, saw his wife on the floor of the last room he searched, the parlor, in front of its gas fire. Feeling her hand, he concluded that she was dead and noted his mackintosh was lying on the floor underneath her bludgeoned body. To the Johnsons, who had entered behind him, Wallace spoke with notably little emotion: "They've finished her," he said. "Look at her brains" (qtd. in Goodman [1969] 2017, 41).

Wallace (1931) asked Mr. Johnson to go for the police and a doctor. In his statement, he wrote that he discovered afterward about four pounds in currency had been removed from the household cash box kept in the kitchen. He added, "but I am not sure of the amount." Also in the kitchen, a cabinet in which he kept "photographic stuff" had been broken open (Wallace 1931). When the police arrived and searched the house and surroundings, they noted there was no sign of breaking and entering, leading them to theorize Julia must have admitted her killer.

Early on, police were suspicious of Wallace's fruitless business appointment (discussed presently) and began to consider him their prime suspect. Noting the absence of any blood spatter on his clothes, investigators theorized he might have worn the mackintosh (which was his) over his naked body during the fierce attack, then washed up after, before heading off on his business errand.

However, I have developed a very different idea: The killer, having conducted many "thought experiments" in advance, quickly threw the mackintosh over Julia's head and shoulders and, forcing her down, struck her on the head repeatedly with his weapon (discussed later). Thus, the garment was not used to cover *him* (a protective measure full of problems) but instead to cover *her* and so confine the spatter in the first place. (As far as I have learned, this critically different hypothesis has never before found its way into print.) Unfortunately, police mishandled the raincoat—removing it from its position partially under the body for inspection, then placing it beside the body for the police photographer (Goodman [1969] 2017, 58–60).

Thus, the garment was not used to cover *him* (a protective measure full of problems) but instead to cover *her* and so confine the spatter in the first place.

True-crime writer Jonathan Goodman ([1969] 2017, 46) called the raincoat "probably the most controversial article of clothing in the annals of crime." There was blood inside one sleeve and a burned edge that later suggested to prosecutor J.R. Bishop (1931) that the killer may have attempted to destroy it.

Further to the "mackintosh theory," an upstairs bathroom water closet bore on its top rim "a bloodstain which, there is no doubt at all, was of the same period of time as the murdered woman's death" (Bishop 1931). The blood presence, I note, suggests the killer may have gripped the rim to steady himself when he stepped inside. It does indicate a tall man, and Wallace stood six feet two inches tall. There was also a blood clot in the porcelain lavatory bowl, believed by the medical examiner to also be "an indication that the murderer had washed himself in the bathroom before leaving the house" (Goodman [1969] 2017, 20, 60–61).

There was, to my mind, an even more telling blood clue. While the blood in the lavatory and on the water closet pointed only to an unknown killer, blood elsewhere seemed to point specifically to Wallace. Police discovered four one-pound banknotes in an ornamental vase in a bedroom upstairs, and on one of these there was a smear of human blood, as from a finger or thumb (Goodman [1969] 2017, 131, 288). This suggests that Wallace, a frugal man in Depression-era Liverpool, in staging a fake burglary of his premises, decided neither to place extra bloody cash (presumably from the cash box) in his pocket nor destroy it. He could retrieve it from the vase later, not taking valuable time to sort the stained from the unstained bills at the moment. But the police discovery of the hidden bills was extremely revealing.

Prosecutor Bishop (1931) learned that the cash box had been "on a high shelf where one would not expect to look for a cash-box." Additionally suspicious was the fact that the thief/killer had replaced the inside tray, closed the box, and returned it to the high shelf—unlikely behavior for a thief indeed! It could instead indicate a lapse in thinking if Wallace staged the "robbery."

Wallace's 'Appointment'

Wallace's alibi—the unlikely after-work appointment—came about in a curious way. The day before the murder, that is, on the evening of January 19, Wallace visited his club—for a game, something he did infrequently. (He attended only about once per fortnight and had not been there since before Christmas.)

It was therefore unusual—to say the least—that someone he did not know had unexpectedly called for him there. Club Captain Samuel Beattie took the phone call.

Beattie told the caller he would relay the message if possible but that Wallace "may not be here tonight," adding, "I suggest you ring up later."

"Oh no, I can't. I'm too busy," the voice said. "I have my girl's twenty-first birthday on, and I want to do something for her in the way of his business. I want to see him particularly." He stated he wanted Wallace to come see him at his home the next night at 7:30 p.m.

Beattie took the man's name, "R.M. Qualtrough," and address, "25 Menlove Gardens East," which he wrote on the back of an envelope. When Wallace later arrived at the club, he took the note and, putting it in his pocket, said he did not know anyone by that name but would keep the appointment tomorrow anyway (Goodman [1969] 2017, 19–22).

In investigating the mystery telephone call, police suspected Wallace had himself cleverly phoned the cafe where the chess club meetings were held. They thought he had been careful to disguise his voice when giving his message to Beattie, "because his normal voice would have been recognized" (Bishop 1931). Investigators found that three telephone personnel (two operators and a supervisor) agreed that the voice of the caller in question had been "quite ordinary," while Beattie had described the voice as particularly "strong and gruff." Moreover, in a stroke of luck, the very telephone box from which the call had been made was identified: It stood just 400 yards from Wallace's house! He could have walked to the phone, made the call to the chess club, then—the stop being just twenty-five yards away from the telephone—taken a tram to the club (Goodman [1969] 2017, 77–79)!

As it happened, the appointment did prove a ruse. After Wallace had finished work the next day (January 20, the day of the murder), he went home and had dinner with Julia, then set off on his quest for 25 Menlove Gardens East. In his travels by train and on foot, he queried a surprising number of people as to the location, but everyone told him there was no such place, including a tram inspector, policeman, and others. There was a Menlove Gardens but no Menlove Gardens East. Prosecutor Bishop (1931) assessed Wallace's actions:

> He says that having been unable to find this address, he became suspicious and felt that something was wrong, and so he returned home. Why should he become suspicious that something was wrong at home because some address that had been given to him turned out to be wrong? I suggest that he, in fact, knew what was wrong, and that the time had come for him to make the discovery [of his wife's body]. He says he hurried home, but as a matter of fact, he was seen in conversation with some man within a very few yards of his home, apparently standing and talking.

The prosecution believed he was actually waiting until he could meet one or two persons who would go into the house with him to make the discovery (Bishop 1931). They believed his trouble with the back door lock—which had nothing wrong with it, although he claimed it would stick sometimes (Wallace 1931)—was part of his delaying tactic.

In assessing Wallace's unusual alibi, the police focused carefully on the

timeline. Their tests involving witnesses (notably a milk delivery boy) indicated Wallace could not have left the house any later than 6:49 p.m. They deduced that *Julia had already been murdered* by that time, and they found a window of opportunity, for Wallace as killer, of some eighteen minutes duration—quite long enough. Unfortunately, any estimate of the *time of death* was questionable, because the medical expert declined to measure such elementals as the temperature of the body or that of the parlor in which she had lain (Goodman [1969] 2017, 48–49, 119).

A Game of Chess

Wallace's alibi seemed to have him moving about like a chess piece during the time of his wife's murder. Sherlock Holmes had a pointed opinion of chess-playing: As he observed to his companion, it is "one mark, Watson, of a scheming mind" (Doyle 1930, 1320). The Liverpool public seemed to agree, interpreting Wallace's being a chess player as evidence that he would be able to devise a murder plan more cunning than that of the average person. Goodman ([1969] 2017, 102) states he was reportedly "a master player; a mind as brilliant as it was perverted, trained to think ahead to the next moves, and to anticipate the moves which his opponent would make." Strikingly, in his diary, several days before the murder, Wallace had written (though it was a bit garbled): "Work out some definite scheme of study of properly planned and rigorously adhered to each particular difficulty consistently tackled and overcome." Gannon (2012, 30) concedes it could "mark his determination to plan the perfect murder."

While Goodman himself thought that Wallace's chess skill was exaggerated, Wallace had additional skills. Recall that, not unlike Sherlock, he also had a mind for chemistry and microscopy. These could have proved useful in his planning—with regard, say, to the detectability of minute droplets of blood spatter. None of this is direct proof of his guilt, but popular sentiment was still against him. One spectator at court made a remark that punned on prosecutor Bishop's surname: "Wallace, the chess-murderer, got rid of his queen, but now he's having trouble with a Bishop" (Goodman [1969] 2017, 131).

Wallace's "cadaverous" appearance (Wilkes 1984, 13), and even his distant manner, worked against him. One observer of the trial, crime writer F. Tennyson Jesse, stated: "The jury did not like the man, or his manner which could have been either stoicism or callousness. They did not understand his lack of expression … and they knew it hid something. It could have hidden sorrow or guilt and they made their choice" (qtd. in Hunt and Thompson 2019, 35–36). There being only highly circumstantial evidence and a lack of any clear motive, at the end of the four-day trial the jury deliberated just one hour before finding William Herbert Wallace guilty and sentencing him to go to the gallows. After the case was overturned on appeal, the police declined to try Wallace again, and he died just two years later. He was buried beside Julia (Goodman [1969] 2017, 251–271).

Crime writers have cast about for another suspect. In 1969, Jonathan Goodman pounced on Richard Gordon Parry, whom Wallace had once caused to be fired. Police subjected him to "the most vigorous investigation, even to the point of examining seams of his clothes for traces of his blood" (Wilkes 1984, 159). His alibi was imperfect; the woman who told police he was with her for the evening admitted that did not include the exact time of the murder, but she remained steadfast in her defense of him until his death in 1980 (Goodman [1969] 2017, 300–304). Parry was named again by Roger Wilkes, who admittedly relied on his "gut feeling" for his speculative book *Wallace: The Final Verdict* (Wilkes 1984, 11). Yet again, John Gannon (2012, 174–191) complicatedly theorized that Wallace persuaded Parry to make the phone call and blackmailed one Joseph Caleb Marsden into murdering Julia—who was imagined as having a sexual relationship with him. However, Marsden appears to have been only an acquaintance of the Wallaces (Hunt and Thompson 2019, 36–37).

Whether Wallace or some other person murdered Julia, there was much mystery over the missing murder weapon. Police believed it was an iron bar, fifteen inches long and a half inch in diameter, kept by the gas stove and used for raking spent matches and cigarette butts from underneath. It would have been most convenient to an empty-handed killer! After learning of its existence from a former once-weekly charwoman who detailed its appearance at trial (Wilkes 1984, 117), police searched in vain for it—even outside the house and along streets Wallace had walked in supposedly searching for the mystery caller. Goodman ([1969] 2017, 72) concedes Wallace would not have wanted the iron bar found, because "it would provide damaging evidence against him." If no murder weapon was found, that would seem to suggest it belonged to the supposed robber-killer. The iron bar finally came to light in the mid-1930s when the stove was removed by later tenants, in converting the house to electricity. It was lying in a narrow gap between the wall and hearth, but nothing further is now known of it. Although it is not impossible to have accidentally found its way into the gap, I believe that was Wallace's long-lost hiding place, and he made a mistake regarding it. After police learned of the bar, he brought more suspicion on himself by disclaiming any knowledge of such a rod (Goodman [1969] 2017, 71–73, 279).

Paranormalities?

Unsurprisingly, some paranormal claims have surfaced in the case but provide little more than amusement. When new tenants at 29 Wolverton Street tired of visitors peering in their front window, lured by reputed sightings of Julia's ghost, they prepared a surprise for ghost seekers: a large doll positioned as Julia had lain in the parlor, its throat cut, and sawdust scattered on the floor. It unnerved at least one young curious police constable! A subsequent tenant, apparently unaware of the place's notoriety, lived

there for an indefinite time undisturbed (Goodman [1969] 2017, 311).

Among crank calls to police came one from an astrologer, who offered assistance from the stars in learning the murderer's identity, and one from a faith healer, who wanted to try to revive Julia. Both offers were declined. A "spiritualist lady" had more success, even claiming to have gotten through to the alleged Other Side. She reported having heard Julia's disembodied voice, speaking more in sorrow than in anger: "*Herbert, how could you?*" (Goodman [1969] 2017, 70, 103–104).

Then there was a legend that circulated in Liverpool, picked up by Goodman in his research ([1969] 2017, 307): Supposedly, "Julia, the day before she died, pleaded with a neighbor for protection—she had a feeling, you see, a premonition if you like, that her husband wanted her out of the way." The story is tantalizing, and it is unfortunate that it comes to us without any real documentation, because such feelings are not uncommon in homicide cases.

Conclusions

In the final analysis, I think we can dispense with the usual extraneous suspect, Mr. Parry. To those who cannot find a motive for William Herbert Wallace, I suggest he may have tired of being corralled into his wife's sphere of performing duets. I suspect he wished to be left alone with his science experiments—a useful irony if science gave him the idea of thwarting the estimation of time of death by carrying out his attack on her so as to leave her body right in front of the gas fire. Finally, Julia's brutal bludgeoning seems to speak of *personal* animosity.

It may appear that I was suspicious of Wallace from the outset. I must have been. I was after the killer, and his cleverness was too obvious—at every turn. I have saved until the end a very interesting final clue suggestive of his guilt. On the fatal day, about 3:30 in the afternoon, a police constable named James Rothwell was cycling to work. He saw Wallace, whom he knew, out making his insurance rounds. Wallace's face was pale, drawn, and haggard, and he seemed "unusually depressed." He appeared to Rothwell to have been crying and, in fact, had his head down, while dabbing at his eyes with his coat sleeve (Wilkes 1984, 35, 95; Gannon 2012, 55). This otherwise mysterious distress, so close to Julia's impending murder, seems a telling forecast of what Wallace—and only he—knew was coming. ■

Acknowledgments

I am grateful to Julia Lavarnway, SI managing editor, and Tim Binga, director of CFI Libraries, for help in obtaining source material.

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[BEHAVIOR & BELIEF STUART VYSE

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French Science and Pseudoscience: A Skeptic's Tour of Paris

Thanks to the COVID-19 vaccines, I recently had the opportunity to visit Paris, France, for the first time. In addition to the usual art museums and tourist spots, I approached the city with the goal of visiting some of its scientific and pseudoscientific points of interest. France has a proud history of achievement in science and mathematics, as well as some brushes with pseudoscience and the paranormal, much of which is on display in Paris for the interested traveler. What follows is by no means an exhaustive list.

An astrolabe made in 1569 by Rennerus Arsenius

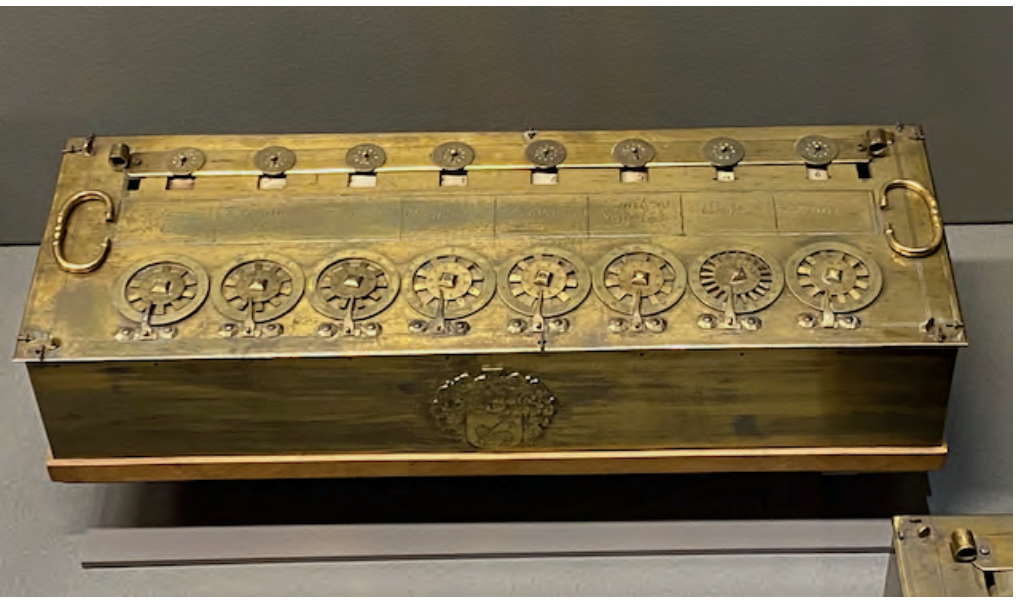
Musée des Arts et Métiers

I had come to France to speak at the Timeworld 2021 World Congress (https://timeworldevent.com/), which this year was organized around the theme of "randomness." The congress was held at the Conservatoire National des Arts et Métiers (National Conservatory of Arts and Crafts), which is on the same campus as the Musée des Arts et Métiers. The museum was founded in 1794, during the French Revolution, as a repository of scientific instruments and inventions and contains many beautiful objects.

When you visit a science museum in another country, you are immediately aware of how nationalistic these institutions are. However, in the fields of science and mathematics, the French have many achievements. The museum displays beautiful brass instruments, including an astrolabe made in 1569 by Rennerus Arsenius (shown above) and several of Blaise Pascal's early computing devices.

The French made many advances in the field of photography and motion pictures, and the museum contains several early cameras and also presents some very early examples of motion pictures.

A major attraction of the Musée des



One of Pascal's seventeenth-century computing devices with six whole number digits and two fractional digits

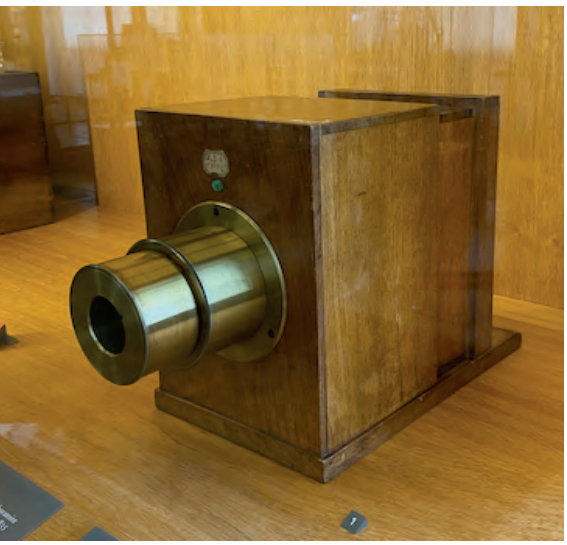
Foucault's Pendulum at the Panthéon

Arts et Métiers is Foucault's Pendulum, but I will save it for the next section.

The Panthéon

A beautiful domed structure, the Panthéon sits at the top of a hill in the Latin Quarter on the former site of the Abbey of St. Genevieve, patron saint of Paris. In 1744, King Louis XV promised to build a structure more fitting for Genevieve, but the building was not completed until 1790, after the beginning of the French Revolution. Initially the structure was to be the Church of Genevieve, but during the revolution it was renamed Temple of the Nation, and many revolutionary figures were buried there, including Voltaire, Jean-Paul Marat, and Jean-Jacques Rousseau. Under Napoleon Bonaparte, the Panthéon returned to being a church. Over the years, as republican governments came and went, the building alternated between religious and secular uses. The Panthéon continued to serve as a mausoleum for notable French figures, including Victor Hugo, Marie Curie, and André Malraux.

Today, in addition to the graves of honored citizens and the stunning architecture of the building, the main attraction of the Panthéon is Foucault's Pendulum. In 1851, astronomer Léon Foucault (1819–1868) hung a very large pendulum from the dome of the Pan-



One of Louis Daguerre's (1787–1851) early cameras (circa 1835). This "two box" camera was designed so the rear box could move back and forth to focus the image on the plate (not shown). Daguerre invented the Daguerreotype, an early photographic method. (Unless otherwise noted, all the photographs in this article were taken by the author.)

Foucault's Pendulum at the Musée des Arts et Métiers

théon as a demonstration of the rotation of the Earth. A few months later, the pendulum was moved to the Musée des Arts et Métiers. Today, the original pendulum is still at the museum—although the original fob fell off and is displayed in a case next to the pendulum—and a somewhat grander replica hangs in the Panthéon. So, visitors to Paris have two opportunities to see Foucault's Pendulum: in the center of Paris at the Musée des Arts et Métiers or on the Left Bank at the Panthéon. Both are impressive, but the Panthéon's architecture is far more dramatic.

Saint-Étienne-du-Mont

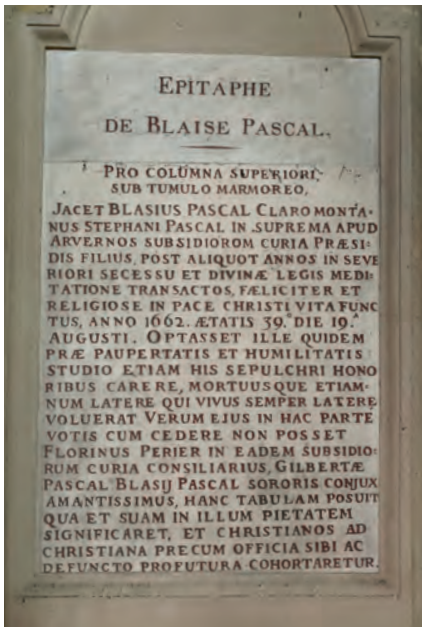
Just behind the Panthéon is Saint-Étienne-du-Mont, a beautiful church whose construction began in the late fifteenth century and was not completed until 1624. Saint-Etienne contains the tomb of St. Genevieve, but for the skeptical tourist, the most notable interment is mathematician and philosopher Blaise Pascal (1623–1662).

Pascal was a child prodigy who made many contributions in mathematics and science. While still a teenager, he built his first calculators in an effort to help out his father, who had been appointed the king's tax collector in the city of Rouen. Several of his calculators are on display in the Musée des Arts et Métiers. Pascal is considered a father of modern computing, and the Pascal computing language is named in his honor.

Pascal experienced a religious conversion in his twenties, and he is famous for having described "Pascal's wager," which represents an early application of expected value to rational decision making (Ross 2004). The expected value of a bet can be determined by the product of the value of the possible outcomes and the probabilities of those outcomes. In the posthumously published work *Pensées* (*Thoughts*), Pascal argued that if God existed and you believed, there was the possibility of infinite gain through eternal salvation. Against this are the finite costs of needlessly living a Christian life if God does not exist. Pascal argued that even if the probability of God's existence were very small, the potential benefits of faith made the wager that God was real worth it. Pascal's wager has been criticized on several grounds, but it is clear Pascal took the bet. His burial in Saint-Étienne-du-Mont is marked by a plaque.

Musée d'Histoire de la Médecine

Of all the stops on my list, one of the most anticipated was the Musée d'Histoire de la Médecine (Museum of the History of Medicine), housed at the Université Paris Descartes. The museum has a large collection of antique surgical instruments, and I was particularly interested in seeing the original 1887 painting *Une leçon clinique à la Salpêtrière* (*A Clinical Lesson at the Salpêtrière*) by André Brouillet (1857–1914), which hangs in the museum. The large canvas shows neurologist Jean Martin Charcot (1825–1893) demonstrating hypnosis with a famous hysterical patient, Marie "Blanche" Wittman (1859–1915). Many famous physicians of the day are depicted in the painting, most notably Charcot, standing to the left of Wittman, and Georges Gilles de la Tourette, the discoverer of Tourette syndrome, seated to Charcot's left, wearing an apron.


EPITAPHE
DE BLAISE PASCAL.

PRO COLUMNA SUPERIORI.
SUB TUMULO MARMOREO,
JACET BLASIUS PASCAL CLARO MONTANUS STEPHANI PASCAL IN SUPREMA APUD ARVERNOS SUBSIDIORUM CURIA PRÆSIDIS FILIUS, POST ALIQUOT ANNOS IN SEVERIORI SECESSU ET DIVINÆ LEGIS MEDITATIONE TRANSACTOS, FÆLICITER ET RELIGIOSE IN PACE CHRISTI VITA FUNCTUS, ANNO 1662. ÆTATIS 39. DIE 19. AUGUSTI. OPTASSET ILLE QUIDEM PRÆ PAUPERTATIS ET HUMILITATIS STUDIO ETIAM HIS SEPULCHRI HONORIBUS CARERE, MORTUUSQUE ETIAM-NUM LATERE QUI VIVUS SEMPER LATERE VOLUERAT. VERUM EJUS IN HAC PARTE VOTIS CUM CEDERE NON POSSET FLORINUS PERIER IN EADEM SUBSIDIORUM CURIA CONSILIARIUS, GILBERTÆ PASCAL BLASII PASCAL SORORIS CONJUX AMANTISSIMUS, HANC TABULAM POSUIT QUA ET SUAM IN ILLUM PIETATEM SIGNIFICARET, ET CHRISTIANOS AD CHRISTIANA PRECUM OFFICIA SIBI AC DEFUNCTO PROFUTURA COHORTARETUR.

Plaque commemorating Blaise Pascal's burial at Saint-Étienne-du-Mont

Unfortunately, when I arrived at the university in early July, I was informed that the museum was being renovated

Une leçon clinique à la Salpêtrière by André Brouillet (1887), showing the French neurologist Jean Martin Charcot lecturing (Wikimedia)

and would not reopen until August. I was able to tour the grand lobby of the university building, which is lined with busts of famous faculty members, and among those in attendance was a bust of the great anatomist and anthropologist Paul Broca (1824–1880). Broca made many medical discoveries and innovations, but he is most famous for identifying an area on the left frontal lobe, now called Broca's area, that is associated with speech production. People with damage to Broca's area understand language but have profound difficulties in forming meaningful words and sentences (Larson 2011).

Despite his many contributions, Broca's image is tarnished by his promotion of several racist theories of human differences. He supported the view that human ethnic and racial groups rose independently and did not share a common ancestry. He also engaged in comparative studies of skulls in an effort to find measurements that were correlated with intelligence and race (Gould 1996).

Père Lachaise Cemetery

Père Lachaise is the most famous cemetery in Paris and a popular stop for pilgrims visiting the graves of Jim Morrison, lead singer of The Doors, or the writers Gertrude Stein, Alice B. Toklas, Oscar Wilde, or Richard Wright. Because, by coincidence, the day I visited was the fiftieth anniversary of Morrison's death, there was a gaggle of baby boomers gathered around his gravesite burning incense and singing Doors songs. However, my most important stop was another grave just a stone's throw away.

Sophie Germain (1776–1831) was a remarkable French mathematician, as much for the obstacles she overcame to become a mathematician as for her mathematical achievements, which were considerable (Musielak 2020). Germain was the daughter of a wealthy Parisian merchant who was politically active in the years preceding the French Revolution, having been elected a representative of the Third Estate (the proletariat and common people). Violence broke out in the summer of 1792, and when the new republic started beheading members of the old monarchy, Germain's family lived just five hundred meters from the guillotine. Germain took refuge in her father's library, where her interest in mathematics was ignited by reading the story of Archimedes. Because mathematics was not considered an appropriate vocation for women, Germain suffered resistance, even from within her own family, and her education would be largely self-guided.

After the Reign of Terror ended, the *L'Ecole Polytechnique* opened in Paris in 1794, but Germain was barred from attending because she was a woman. However, at that time, lecture notes (*cahiers*) were published, and as a result, she was able to use them to study. According to legend, Germain submitted problem solutions to one of the professors, the great mathematician Joseph-Louis Lagrange, under the assumed name Monsieur Le Blanc. Lagrange eventually demanded an audience with the brilliant M. Le Blanc, and Germain was forced to reveal herself. But Lagrange was delighted to meet her and went on to become her mentor and friend.

Because she was a woman, Germain never got a degree or held an academic position and remained an independent, largely self-taught student her entire life. Eventually, though, she became known by her own name in the mathematical community. In 1816, she won the Institut de France prize—the first woman to do so—for her theory of vibration of curved and elastic surfaces and contributed foundational work toward a proof of Fermat's Last Theorem. The German mathematician Carl Friedrich Gauss, with whom Germain corresponded, recommended her for an honorary degree from the University of Götteningen, but she succumbed to breast cancer in 1831 before the award could be arranged.

Germain continued to suffer indignities after her death. When the Eiffel Tower was constructed in 1887–1889, Gustave Eiffel engraved the names of seventy-two French scientists around the base. All were men. Although Germain's work in elasticity was necessary for the construction of the tower, her name was omitted (Gray 1987). It is assumed by many that, once again, she was excluded on the basis of her sex.

When I visited her grave, which was quite difficult to find, I discovered that there was a large tree growing out of it. There is a plaque mounted on her gravestone, awarded by the students of a girls school named in her honor, but it was difficult to get a good look at the stone due to the tree.

I visited two other notable graves in Père Lachaise. Samuel Hahnemann (1755–1843), the inventor of the dis-

Bust of anatomist and anthropologist Paul Broca in the lobby of the Université Paris Descartes

Portrait of Sophie Germain at age fourteen (Wikimedia)

The grave of mathematician Sophie Germain

The gravesite of Samuel Hahnemann, the father of homeopathy

credited medical theory of homeopathy, was living in Paris at the end of his life and is interred in a large monument/mausoleum on the side of a hill. Upon his death in 1843, his wife, Melanie Hahnemann, kept his burial a secret and had him buried in a simple grave in Montmartre Cemetery in Paris. When she died in 1878, her body was placed next to his. Near the end of the nineteenth century, an international group of homeopathic physicians arranged for both Hahnemanns to be exhumed and reburied in the far more prestigious Père Lachaise Cemetery under a very large monument (Arora 2020).

Also at Père Lachaise is the grave of the French physiologist Claude Bernard, who championed experimentation in medicine and, recognizing the danger of scientists who have a stake in the outcome recording their own data, introduced the concept of blind testing in experiments (Daston 2005). Bernard also did foundational work on the internal environment of organisms that paved the way for Walter Cannon's introduction of the concept of *homeostasis*.

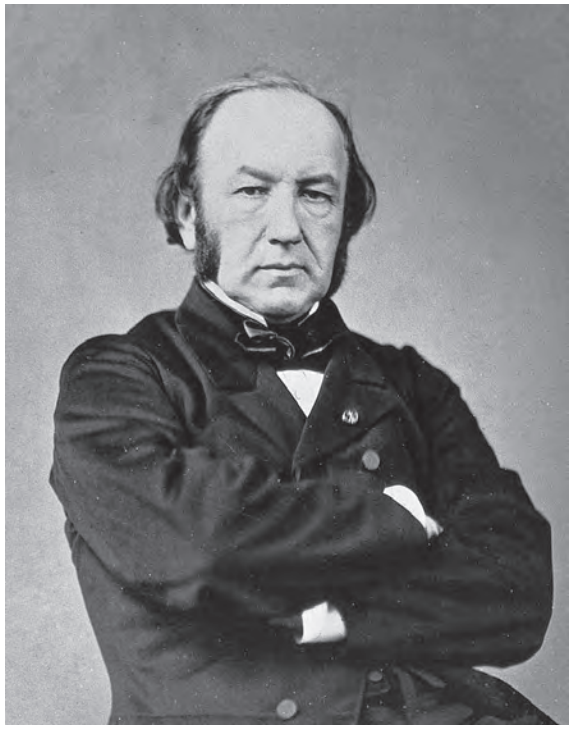
Montparnasse Cemetery

The Montparnasse cemetery is the second most famous in Paris. It's smaller than Père Lachaise but also very beautiful. It is known for containing the graves of American actress Jean Seberg, poet Charles Baudelaire, playwrights Samuel Becket and Eugene Ionesco, and philosophers Jean-Paul Sartre and Simone de Beauvoir.

In addition, several important French mathematicians and scientists are buried there, among them Henri Poincaré (1854–1912), the brilliant mathematician who made contributions to many areas of pure and applied mathematics (Verhulst 2005). He is most remembered for Poincaré's conjecture, published in a 1904 paper, which proposed that "Every simply connected, closed 3-manifold is homeomorphic to the 3-sphere." (I don't understand it either.)

Although the conjecture inspired considerable effort on the part of mathematicians all over the world, almost a century elapsed before a reclusive Russian, Grigori Perelman, posted a solution that was later credited with proving the conjecture, now a theorem. For his work on the Poincaré conjecture, Perelman was awarded the Fields Medal and the Millennium Prize, both of which he declined.

In his day, Poincaré was a public figure who often made himself available to journalists and injected himself into the famous Dreyfus Affair. In 1894, Alfred Dreyfus, a Jewish army officer, was falsely accused of being a spy for Germany. Due, in part, to the public controversy created by this episode, Dreyfus was awarded a second trial in 1899, at which pseudoscientific graphology and a dubious probability analysis were offered as evidence against him. In response, Poincaré wrote a letter com-



Portrait of Claude Bernard (Wikimedia)

CLAUDE BERNARD
MEMBRE DE L'INSTITUT
PROFESSEUR AU COLLÈGE DE FRANCE
MEMBRE DE L'ACADÉMIE DE MÉDECINE
PRÉSIDENT DE LA SOCIÉTÉ DE BIOLOGIE
ANCIEN SÉNATEUR
COMMANDEUR DE LA LÉGION D'HONNEUR
MORT A PARIS LE 10 FÉVRIER 1878

Photo of Bernard's gravesite in Père Lachaise Cemetery, Paris

The grave of French sociologist Émile Durkheim in Montparnasse Cemetery

menting on this evidence, which was read in court. It included the following passage: "Nothing in it has any scientific character. I do not know if the defendant will be sentenced, but if he is, it must be on other evidence. It is impossible that such an argument makes any impression on free-minded people who have received a solid scientific education" (Verhulst 2005, 1042).

Unfortunately, Dreyfus was convicted a second time and would not be fully exonerated and restored to military rank until 1906.

The previously mentioned anatomist and anthropologist Paul Broca is buried in Montparnasse Cemetery, as is the great French sociologist Émile Durkheim. Durkheim is considered a founder of sociology who wrote important works on suicide and the sociology of religion.

Random Encounter—Georgiana Houghton

As part of my tourism in Paris, I visited the art museum at the Centre Pompidou, and, as luck would have it, there was an exhibition titled "Women in Abstraction," which highlighted relatively unsung women pioneers of abstract art. Among the featured artists was Georgiana Houghton (1814–1884)—British, not French—who was a spirit medium and who painted "automatically." During the nineteenth century, women were subjected to prejudice and disenfranchisement, but they were afforded relatively high status in certain activities, including the reform movements (e.g., temperance and suffrage) and spiritualism. Many nineteenth-century mediums were women, and Houghton fell into this group.

In addition to creating her spiritualism-inspired artwork, she was a proponent of spirit photography and near the end of her life published a book on the subject: *Chronicles of the Photographs of Spiritual Beings and Phenomena Invisible to the Material Eye* (Houghton 1882). Spiritualist or not, her paintings and drawings were quite beautiful.

Le Musée Pasteur

One of the greatest of all French scientists was Louis Pasteur, whom we all know for the anti-bacterial process, *pasteurization*, that bears his name. Fewer people know that, appropriate to his nationality, Pasteur first developed the process as a protection against "diseases" of wine. Later it was extended to many other spoilable foods.

Pasteur also made enormously important discoveries in the development of vaccines (Bowden et al. 2003). In 1881, he demonstrated that inoculating sheep with two doses of a weakened anthrax bacilli could protect them from anthrax. This work led directly to his development of a lifesaving vaccine for rabies.

Pasteur founded L'Institut Pasteur, which continues as a research facility in Paris. It houses, in the apartment that Pasteur occupied during the last seven years of his life, the Le Musée Pasteur, which contains many of his laboratory instruments. Unfortunately for this tourist, like the Musée d'Histoire de la Médecine, the Pasteur museum was closed for renovations when I was in town. I will definitely put this on the list for a future trip.

If you have a trip to Paris in your future, you will undoubtedly want to go to all the usual places, but if you find science and a little bit of pseudoscience intriguing, Paris will not disappoint. ■

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"Out of Time" … The Eye of the Lord (1 September 1, 1870) by Georgiana Houghton

[SCIENCE AS CULTURE

MATTHEW C. NISBET

Matthew C. Nisbet is professor of communication at Northeastern University and writes weekly at *Wealth of Ideas*—a Substack newsletter about science, culture, and history.

The Piltdown Hoax Revisited: History's Most Famous Scientific Fraud

In 1912, the lawyer and amateur archaeologist Charles Dawson sent a letter to his friend Arthur Smith Woodward, head of geology at the prestigious British Museum. He told Woodward about a skull fragment he had found in a gravel pit near Piltdown Common, England. The fragment resembled the "Heidelberg Man"—a Neanderthal unearthed by workmen in Germany a few years earlier. If prehistoric human-like bones were buried near Piltdown, it would not be surprising to Woodward, because many geologists at the time believed that the gravel pit had been left behind by an Ice Age riverbed (Oakley and Weiner 1955).

That summer, the two men began a systematic excavation of the pit. Between 1912 and 1914, the trio excavated pieces of a human-like cranium, fragments of an ape-like jawbone, two teeth, animal bones, and several tools. However, in November 1912, before Woodward could formally present the first batch of fragments to his scientific peers, an unknown informant leaked news of the discovery to the *Manchester Guardian* (Goulden 2007; Goulden 2009).

Portrait painting from 1915 of the Piltdown Skull being examined by John Cooke. Back row: (left to right) F. O. Barlow, G. Elliot Smith, Charles Dawson, Arthur Smith Woodward. Front row: A. S. Underwood, Arthur Keith, W. P. Pycraft, and Sir Ray Lankester. Note the painting of Charles Darwin on the wall. Credit: Public domain, Wikimedia.

"The Earliest Man? Remarkable Discovery in Sussex—A Skull 'Millions of Years Old?'" was the headline. The apparent ape-human creature was "certainly from the beginning of the Pleistocene period," and "there is no doubt of its authenticity" declared the newspaper. The cranium and jawbone were in fact the "earliest trace of mankind that has yet been found in England." In comparison to Germany's famous Heidelberg Man, these fragments suggested "a much lower and more primitive type of mankind" ("The Earliest Man?" 1912).

But there was more: The discovery, according to the newspaper, promised to settle a debate that had raged since Charles Darwin's 1871 publication of *The Descent of Man*. Darwin's "theory of evolution applied to man suggest [*sic*] that he had a common origin with the apes," *The Guardian* reminded readers. Yet to satisfy Darwin's skeptics, the "need has been felt for discovering 'the missing link' between the highest apes and the lowest men'" ("The Earliest Man?" 1912).

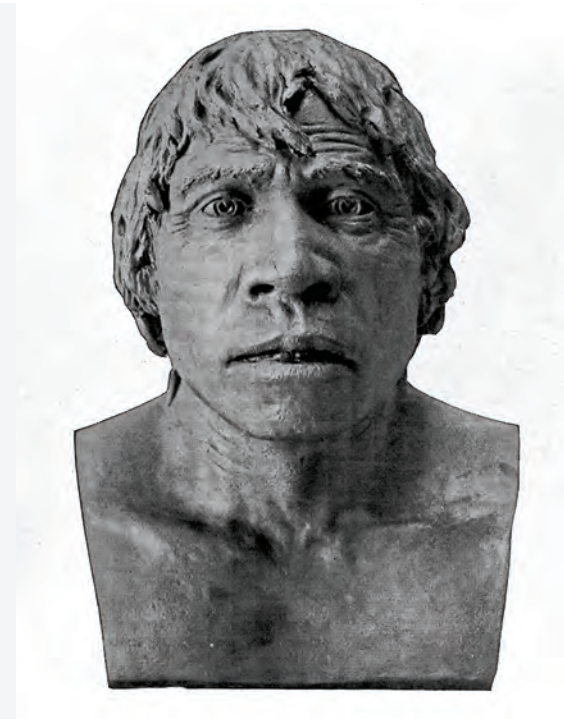
In 1891, on the island of Java (part of present-day Indonesia), Dutchman

Bone fragments that were claimed to be evidence of Piltdown man. Credit: Judy BreckJ, CC BY-SA https://flic.kr/p/5pi9ta

Eugène Dubois had discovered fossilized remains of a small partial cranium, teeth, and a modern-looking femur indicative of an upright posture. Dubois named the species *Pithecanthropus erectus* (erect ape-man), claiming it was a "missing link." Many geologists doubted the claim. But in contrast to "Java Man," with the Piltdown discovery "there appears to be no doubt whatever of its genuineness" according to the newspaper, and "more than a possibility of its being the oldest remnant of a human frame yet discovered on this planet" ("The Earliest Man?" 1912).

The Geological Society of London held a special December 1912 meeting so that Woodward could formally present the publicized discovery. Using lantern slides and diagrams, he argued that the bone fragments represented an ape-human individual from the early Pleistocene period, possibly the oldest such remains found in the world. He named the species *Eoanthropus Dawsoni*, "The Dawn Man" ("Piltdown Man" 1912; Dawson and Woodward 1913). The fragments, however, would become more popularly known as "Piltdown Man."

In convincing the majority of his peers in attendance that day, Woodward likely benefited from the advance publicity. The *Manchester Guardian* had spun a vision of an early Pleistocene ape-man that resonated not only with British nationalism but also with the iconic quest to locate the "missing link." The newspaper's vivid account went well beyond the more cautious, tentative style of arguments that Woodward was permitted to present to his peers.



Restoration of the head of Piltdown Man. Wellcome Collection. Attribution 4.0 International (CC BY 4.0)

Status Seeker

Woodward and Dawson followed their 1912 presentation—and subsequent ones—by publishing the proceedings in the official journal of the Geological Society. But as news spread outside of Britain, foreign scientists voiced their skepticism about the authenticity of the alleged "missing link." When requests to directly examine the fragments were denied, the decision deepened their suspicions (Oakley and Weiner 1955).

In 1915, "Piltdown Man II" was discovered a few miles away from the original pit. The fossil fragments included a human-like cranium and ape-like tooth with wear marks unlike any modern ape. The emergence of a second Piltdown Man silenced skeptics. However, over the next few decades—as more human-ape remains were found in South Africa, Java, and China—each were anatomically opposite to Piltdown Man. Their skulls were more ape-like and their jaw bones more human-like. These subsequent findings appeared to form a consistent evolutionary tree (though only if Piltdown Man was excluded from consideration). Piltdown Man supporters, however, could still reason away the mounting discrepancies by claiming that their favored bones were much older, thereby representing a separate man-ape species (Oakley and Weiner 1955).

In 1953, Kenneth Oakley of the British Museum and J.S. Weiner of the University of Oxford published a study with colleagues that reexamined the Piltdown fragments using advanced stereomicroscope technology, a new fossil dating method, and other innovative techniques (Weiner et al. 1953). Their tests placed the skull as no older than 50,000 years, rendering Piltdown Man an "evolutionary absurdity," with no known ancestor or descendant. They concluded that a "modern ape jaw had been deliberately placed with the more ancient brain-case, and that to disguise its modern character and link it with the human brain-case, the bone had been suitably stained, and the teeth deliberately ground down" (Oakley and Weiner 1955).

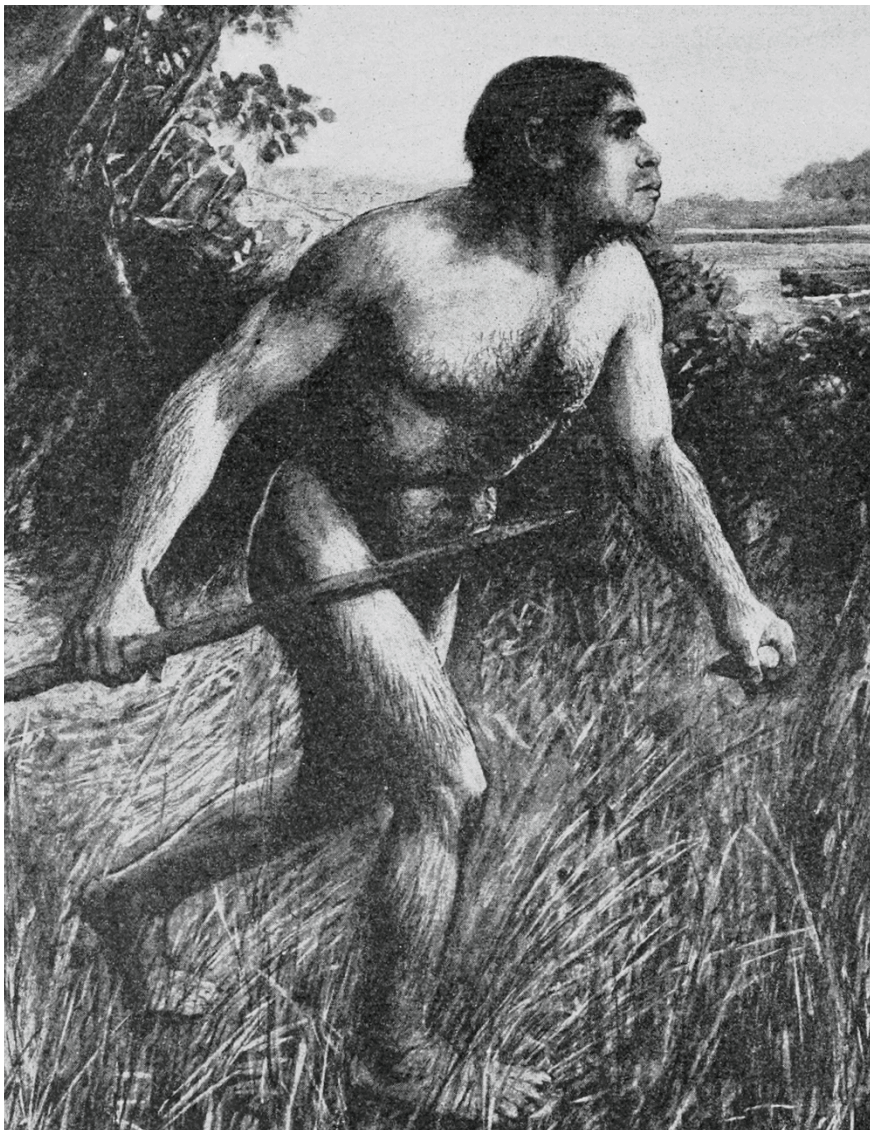
More than sixty years later, a team of anthropologists led by Isabelle de Groote published a follow up study describing their investigation of the Piltdown bone fragments using DNA analyses, CT scanning, and X-ray tomography. They concluded that the jawbone fragments for both Piltdown I and II came from a single Borneo orangutan, and the skull fragments from two or three possibly medieval humans. The bones and teeth had been cleverly loaded with gravel held in place with pebble plugs; this made them feel heavier and therefore more like fossils. Silicate dental putty was used to reconstruct the fragments and piece them together where needed (de Groote et al. 2016).

Since the 1950s, at least twenty individuals have been suspected of involve-

ment in the hoax. However, based on their analysis, de Groote et al. (2016) concluded that Dawson was the lone perpetrator. He was the generator of the original fragment, and he either found the rest of the fragments or was conveniently present when they were discovered. The consistency in method for how the flints and bones were chiseled and manipulated also suggest that a lone person did the work. Dawson had the connections to obtain the skull, jawbone fragments, mammal fossils, and tools that he stained and manipulated. He likely knew who to talk to at the newspapers and was friends with Woodward, then head of geology at the prestigious British Museum. Notably, after Dawson's death in 1916, no remains similar to those of Piltdown Man were ever again recovered (de Groote 2016).

To pull off a scientific fraud, you have to give scientists what they are looking for. Dawson, as an experienced fossil hunter, knew that the British scientific community was searching for its own "missing link"—and that they believed it would take the form of a stained (thereby fossilized) human-like skull and an ape-like face and jaw. He also likely knew that to corroborate the Piltdown Man, fragments, adjacent tools, and mammal fossils would have to be recovered (de Groote 2016).

But why would Dawson commit such a deception? In 1909, when Dawson claimed the first Piltdown fragment had been handed to him by a worker, he was forty-four years old. By then he had authored or coauthored some fifty publications in geology, archaeology, and history, explains de Groote (2016). But as a prolific amateur, he felt he had never gained the recognition from the scientific establishment he thought he deserved. In a 1909 letter to Woodward, Dawson lamented he was "waiting for the big 'find' which never seems to come along." Later that year, his naval officer brother received a knighthood. Dawson's wife soon wrote to the British Home Secretary, whom she refers to as an "old friend," suggesting that because of his quarter century of scientific service, her husband should receive the recognition he deserved. Before Dawson died, he was nominated for induction into the Royal Society—Britain's highest scientific honor—but the nomination was rejected (de Groote 2016). ■



Reconstruction of *Eoanthropus dawsoni*—illustration appearing in a 1913 edition of *Popular Science Monthly*.
Credit: Public domain, Wikimedia

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[THE PRACTICAL SKEPTIC MICK WEST

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The Galileo Project

Over the past ten years, I've looked at over a thousand UFO photos and videos. They all share one fundamental problem: they are ambiguous.

They're not simply ambiguous in the sense of being unidentified; after all, the acronym stands for *unidentified* flying object. But they are ambiguous in that we cannot rule out mundane explanations. The search for UFOs is not simply a search for something we can't identify; I can do that by looking out of my window at a distant white dot. It's instead a search for something novel, something that's *unambiguously* not a bird, plane, balloon, lens flare, atmospheric effect, or radar glitch. It's something that could *only* represent new technology or a new natural phenomenon—or even aliens.

The photos and videos we see do not fulfill that goal. Most are lights in the sky at night or blurry blobs during the day. Some are larger but blurred by motion. Some seem to clearly show an unusual craft, but a lack of provenance for the image makes it impossible to rule out forgeries.

UFOs seem to exist in what I call a low information zone, defined loosely as the distance or situation where the camera cannot record enough information to resolve what it is looking at. The location of this zone seems to vary with the capabilities of the camera. The information content of a cell phone photo of a UFO matches the information content of photos taken with advanced U.S. Navy targeting pods or more powerful telephoto cameras. It's almost as if the UFO knows the capability of your camera and stays just out of range, just behind a veil of ambiguity. Harvard professor Avi Loeb seeks to pierce that veil.

'Oumuamua

In 2017, Canadian astronomer Robert Weryk made a historic discovery. Using the Pan-STARRS telescope at Haleakalā Observatory, he identified an object heading toward the sun. Initially it was classified as a comet.

Analysis of the object's trajectory led to a startling conclusion. The object was coming in at a nearly straight line and was projected to leave on one. It was the first interstellar object ever detected—seemingly entering the solar system from the space between stars, perhaps from another distant star. Over the next three months, it would slingshot around the Sun and head back into interstellar space. They created a new designation, an interstellar object, and gave it the name 'Oumuamua (a Hawaiian word for scout).

This in itself would be fascinating enough, but there were other things about it that were unusual. The light it reflected from the Sun varied periodically, suggesting it was a cigar- or disk-shaped tumbling object. Also, 'Oumuamua did not behave like a typical rock. It exhibited nongravitational acceleration. Its velocity away from the Sun was greater than predicted by physics unless there was some additional means of acceleration.

Most astronomers felt this was due to some sort of outgassing. The object could be composed of frozen gasses such as helium. The side facing the Sun would heat up, causing gas to sublimate and be violently ejected, pushing the object slightly along its path. Professor Loeb was not convinced.

A year later, in October 2018, Loeb published a paper that strongly sug-

gested that 'Oumuamua was an alien artifact, perhaps a solar sail. Few scientists were willing to assign the same degree of likelihood to the ET hypothesis. In January 2021, Loeb published the book *Extraterrestrial: The First Sign of Intelligent Life Beyond Earth*, arguing even more forcefully that 'Oumuamua was artificial, hence alien.

UAP and the Galileo Project

This year has also seen the culmination of a UFO flap that had been brewing for years. At the same time as 'Oumuamua's discovery, a *New York Times* story initiated a media storm that eventually led to the Office of the Director of National Intelligence producing a report on U.S. military encounters with unidentified aerial phenomena, or UAP (UFOs), in June 2021. This report, and remarks made by former senior government officials that seemed to give the ET hypothesis credence, prompted Loeb to start the Galileo Project, announced on July 26.

The Galileo Project is billed as "the systematic scientific search for evidence of extraterrestrial technological artifacts." The simple idea being that if there were alien civilizations elsewhere in the galaxy, they might have visited us in the past or perhaps be visiting us now. Why not look for evidence of this? The project initially had three parts. First, there was to be an attempt to obtain high-resolution photographs of lower altitude UAP using networks of ground based telescopes scanning the skies. Second, there would be a search for more objects like 'Oumuamua, with the goal of sending an intercept mission the next time one came along. Third, there was to be a search for unusual satellites in Earth's orbit that might be of extraterrestrial origin.

Interest shifted away from the latter two goals. Small orbiting objects are already tracked and detected by existing networks, and the next 'Oumuamua will be detected just like the first one. But a clear photo of a UFO? That would be gold! Finally, someone was actually on a quest to find the holy grail of UFOlogy. Loeb described what this project might look like:

> The task boils down to getting a high resolution image of UAP. A picture is worth a thousand words. More specifically, a megapixel image of the surface of an unusual object will allow us to distinguish the label: "Made in China" from the alternative: "Made on Exo-Planet X". [...] For visible light, the desired resolution in our example can be obtained by a telescope with a diameter of a meter, which can be purchased off-the-shelf online. The telescope should be linked to a suitable camera, with the resulting data stream fed to a computer system—where optimized software would filter out the transients of interest as the telescope tiles the sky with its field of view. The initial survey could start from a large field of view, but then zoom-in on the object of interest as it is tracked across the sky. (Loeb 2021)

What Could Go Wrong?

The project has some significant challenges. An actual close encounter with a UFO (regardless of what they might actually be) is a very rare event. If you simply put a telescope in a random location, then is it actually reasonable to expect something to show up?

Atmospheric distortion is an issue. I've taken photos of objects, including planes, with a variety of long lenses. For objects over five miles away, the turbulence of the atmosphere is the limiting factor. A bigger telescope won't help unless the object is overhead or the telescope is at a high altitude—and therefore above the worst effects of the atmosphere. But that limits your coverage areas.

How do you aim the telescope? A simple method would be to have one camera (or camera array) that covered the whole sky, looking for moving objects. The control system could then take potential targets and aim a larger telescope at that spot to take a photograph. Because we want a close-up image of a distant UFO, we need extreme magnification of a relatively small object in the atmosphere. This means the telescope will have a very narrow field of view, so pointing it in exactly the correct direction will be very important. I anticipate considerable challenges in capturing a good image, especially of a moving object.

What Is a Picture Worth?

If we have objects flying around in the sky, then surely taking a close-up photograph of them would be the best way of figuring out what they are, right?

Consider what the goal of an investigation into UFOs should be. UFOlogy as an investigation seeks to answer two questions: Are some UFOs nonhuman-controlled craft? and What exactly *are* those UFOs?

What, exactly, will a photo tell you about these questions? Suppose you were to get a good close up of something that looked like a flying propane tank. How would you "distinguish the label" of "made by E.T."? What if it was a silver helium balloon in the shape of a flying saucer?

We already have a variety of photos of supposed UFOs, and they often look like balloons. Some were taken from the cockpits of fighter jets, relatively close up. But they remain ambiguous because we can't tell how big they are or how they move.

Most UFO sightings are memorable not because of what the UFO looked like (which is often too far away to be

Harvard professor Avi Loeb, founder of the Galileo Project; Credit: Aloeb - Wikipedia

distinct) but instead because of how it moved. Hovering, sudden changes in direction, and rapid acceleration and deceleration are the mark of something unusual in the sky. This information is not something that can be recorded in a single image, but it's something you want. If you can accurately record the motion of an object in three dimensions, and it performs maneuvers that no human craft possibly could, then that is an unambiguous indication of UFO = ET (or at least some novel technology unknown to science). That *in itself, without a photograph*, is approaching the holy grail, something that nearly answers the question of if UFOs are nonhuman-controlled craft.

I suggest that a significant focus should be on obtaining accurate 3D tracks. I asked Professor Loeb how this might be done (West 2021), and he said two telescopes a few tens of meters apart could be used for triangulation. This will work to some degree but would probably not be particularly accurate. It would also have the issue of doubling the cost—good large telescopes cost tens of thousands of dollars. Loeb pointed to one possible telescope that cost $500,000, although he suggested they would mostly use cheaper ones.

I suggested two other alternatives to Professor Loeb. First, a network of cheap but sufficiently high-resolution full-sky cameras (or camera arrays) could be arranged in a sufficiently dense way that UFOs would be visible from multiple locations and 3D tracks could be calculated. While no photos could be taken, proof of nonhuman-object motion could still be obtained. This approach has been used for many years by the Global Fireball Observatory coalition, which is looking for meteor fireballs at night (Howie et al. 2017).

Second, a very cheap network of multistatic radar receivers could theoretically cover an even larger area at less cost. This technique uses the signal from existing commercial FM transmitters and times the differences in reflected signals to multiple receivers to triangulate positions.

If nothing is found, then the significance of this result will depend on the coverage area. You can't prove that *all* UFOs are mundane, but you could at least demonstrate that most of them probably are. My concern is that focusing primarily on getting a high-resolution image with expensive telescopes will result in a very small coverage area and hence greatly reduce the chance of finding anything interesting. When nothing interesting is found, then this small coverage area can be cited as an excuse. We need a large-scale survey to demonstrate evidence of absence.

While I would love to see a close-up photo of a UFO and/or a 3D track showing extraordinary motion, I don't expect this project to produce it. Photos and videos are likely to remain ambiguous. UFOs, as they have for over seventy years, will stay just too far away. ■

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[SKEPTICAL INQUIREE BENJAMIN RADFORD

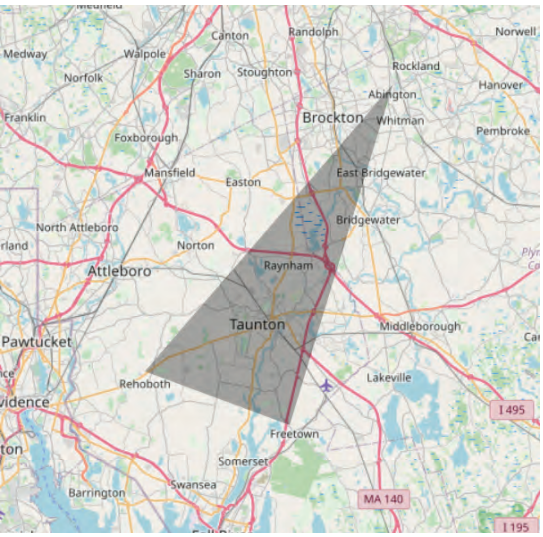
Benjamin Radford is a research fellow at the Committee for Skeptical Inquiry and author or coauthor of thirteen books, including *Big—If True: Adventures in Oddity*.

The Bridgewater Triangle 'Mystery'

Q: **What do you know about the Bridgewater Triangle? I saw that the FX Network optioned a piece about it and planned a scripted series, which I'm not sure was developed. There are some stories here and there, but is anything active still happening? Is it worth doing a deep dig and trying to connect the dots?**

—S. Curry

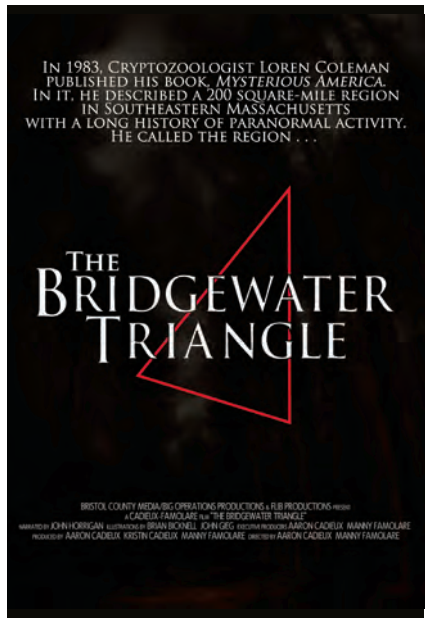
A: I got the above query from a television producer sniffing out fresh angles for a potential show, trying valiantly to avoid (yet another) pale knockoff of an already-premise-flimsy series such as *Ghost Hunters* or *Finding Bigfoot*. I had indeed heard of the Bridgewater Triangle but hadn't done much research into it. The Triangle is touted as a hotbed of mysterious events, strange occurrences, and sinister deeds, though as we will see much of that is hype.



The Bridgewater Triangle, illustrated by Lord Belbury via Wikimedia Commons and based on OpenStreetMap foundation and used by CC license CC-BY-SA-2.0

It's a classic manufactured mystery, ironically—and not coincidentally—modeled after another manufactured mystery, the Bermuda Triangle (which was named and described by a high-profile mystery monger, Vincent Gaddis, and later Charles Berlitz). The Bridgewater Triangle is an area in eastern Massachusetts (see map below). Researcher Loren Coleman popularized the term in his 1983 book *Mysterious America*, noting that "Because of its long history of evil, bedeviled and ominous occurrences, residents have recognized this area of the state for its strange and often sinister character and have, over the years, dubbed it the 'The Bridgewater Triangle'" (Coleman 1983, 28).

What sort of bedeviled and ominous occurrences? You name it: "UFO sightings, mysterious disappearances, creature sightings and a high incidence of accidents, violence, and crime," though "the most famous phantom creature to appear in the Bridgewater Triangle is the notorious Bigfoot." A news article for Deadline.com describes it as "an actual area of well-documented supernatural activity that covers 17 small towns and 200 square miles of New England" (Petski 2019). It was the subject of a 2013 documentary film featuring Loren Coleman, Jeff Belanger, and Chris Balzano. The latter two are prominent writers of "true" ghost stories, and Balzano is author of the book *Ghosts of the Bridgewater Triangle*.


IN 1983, CRYPTOZOOLOGIST LOREN COLEMAN
PUBLISHED HIS BOOK, *MYSTERIOUS AMERICA*.
IN IT, HE DESCRIBED A 200 SQUARE-MILE REGION
IN SOUTHEASTERN MASSACHUSETTS
WITH A LONG HISTORY OF PARANORMAL ACTIVITY.
HE CALLED THE REGION . . .
THE
BRIDGEWATER
TRIANGLE

Where's the Beef?

There's plenty of breathless sizzle to this story, but as accidental skeptic and burger spokeswoman Clara Peller famously asked in the 1980s, "Where's the beef?" (See my March/April 2015 "Skeptical Inquiree" column.) Where's the evidence that this particular patch of land is home to unusually elevated rates of high weirdness?

The variegated nature of "unexplained" phenomena makes it inherently difficult to quantify, much less verify. Identifying seemingly sinister names in landmarks is fairly straightforward (just look for words such as *devil*), but beyond that it's not clear how anyone would reliably measure such a broad range of phenomena. (Does *any* UFO or Bigfoot report, however scant or dubious, count toward a sinister sum?) Coleman does, however, provide us with some easily verifiable claims about the area, such as its "high incidence of accidents, violence, and crime." The area covers some 200 miles and several towns, but there is a medium-sized city, Taunton, which is directly in the center of the supposed mysterious triangle; it should be a valid barometer.

Before trying to explain the reasons (supernatural or otherwise) that the area has a high incidence of accidents, violence, and crime, of course we should verify that it in fact does. For this we can turn to publicly available data. One source, www.city-data.com (2019), notes that "The 2019 crime rate in Taunton is 131 which is 2.1 times lower than the U.S. average." Another data tracker, CrimeGrade.org (2019), gave Taunton an A- ranking for crime: "Taunton is in the 83rd percentile for safety, meaning 17% of cities are safer and 83% of cities are more dangerous." The same source concluded that it's safer than other cities of comparable size. This is of course the *opposite* of a "high incidence," and it's notable that Bridgewater—the town for which the triangle is named—has a crime rate index of 71, *nearly one-fourth the national average*.

Coleman is on firmer ground with the accident rate, however. The same website found that Taunton does have an average accident rate over twice that of the entire state (2019 data). Of course there may be many mundane reasons for this, including population, geography, drunk driving incidence, and so on. In fact, the data show that Taunton has over twice as many drunk driving fatalities per 100,000 population than the state average, which alone could explain the elevated accident rate. There's no need to invoke mysterious malevolent forces as an influence; when you hear hoofbeats, think horses instead of unicorns.

Explaining the 'Triangle'

So is there anything *to* the Bridgewater Triangle? Sure there is. Give me a map and an hour, and I can likely draw you a dozen other equally mysterious "triangles" around the United States. It's easy to do with such broad categories of "unexplained" or "strange" events, including sinister deeds, serial killers, Bigfoot sightings, ghost stories, UFO reports, alleged curses, giant snakes, animal mutilations, giant birds, claims of Satanic cult activity, notable rocks, historical locations, and so on.

There's nothing unique or special about it, but if people want to arbitrarily pick three cities or points and dig deep enough at things that happened inside or nearby, they'll find enough to fill a book or documentary. Lumping disparate "weird things" together and trying to see some hidden underlying common cause or thread is easy to do but not useful. The mystery-mongering mentality underlying the triangle is basically "Oh, look! There was a UFO report in March 1986 here, which is only twenty miles from the spooky-named 'Devil's Rock,'—and look at this! The following year there was a Bigfoot sighting in a nearby town! *Could there be some connection?*" It's a form of anomaly hunting, which as I've described before in this column is not a good investigation technique. Humans are pattern-seeking creatures, and we find patterns in everything, from baseball statistics to clouds. Sometimes those patterns are real, but often they're what we psychologically impose on the world. They're created in our perceptions, not in real life (as in pareidolia).

The search for some underlying grand cause, some real (or, more likely, imagined) connection between these wildly disparate data points is the stuff of fevered Stephen King novels. You also have to think of not only whether there might be some genuine underlying reason for the events but why they would be a factor. For example, someone might say, "Could there be something in the water or environment that could cause weird things to happen or normal people to experience hallucinations or something?" It's hard to think of any specific etiological basis for strange activity in general, but it would depend on what exactly the "strange activity" is. If objects are prone to falling off shelves or walls, it might be in a seismic area with possibly unnoticed tremors (though they'd be recorded by scientists), whereas of course that wouldn't happen away from fault lines. The same thing would apply to strange lights in the sky; they'd be more common around military bases and airports than other places.

I often see exactly this kind of lumping together of unrelated phenomena in my investigations. For example, a couple who believes their house is haunted will attribute anything odd or strange to the ghost or spirit presumed to plague them. Flashlights with batteries that go dead, misplaced household objects, or phone calls with no one on the other end of the line can all be seen as having a common cause, yet they may in fact have completely different causes (old batteries, carelessness, and robocalls, for example). It is of course *possible* that there is an elevated incidence of Bigfoot sightings in the region, but to demonstrate that you'd need to examine other comparable regions. Utah and Arizona, for example, will naturally have fewer Bigfoot sightings merely due to their arid geography and smaller populations—regardless of whether or not Bigfoot exist.

As always, the burden of proof is on the claimants; it's not up to skeptics to prove there *isn't* a so-called Bridgewater Triangle. In the case of the Bermuda Triangle, researcher Larry Kusche chose to take on that burden of proof and found that much of that mystery was the result of mistakes, ignoring obvious explanations, and mystery mongering. ■

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HYPED HOLLYWOOD HORROR

Even decades after their release, Hollywood horror films such as The Exorcist *and* The Entity *remain enigmatic pop culture touchstones—due in large part to the claim that they were based on real events. In this three-article section, three contributors take a look back at two popular cases ingrained in paranormal pop culture. Benjamin Radford finds that though much remains murky about* The Entity *case, there are plausible explanations for the poltergeists that plagued the troubled woman at the heart of the story. Kenny Biddle offers an in-depth analysis of the photographic evidence offered in* The Entity *case, and JD Sword rounds out the special section revealing the long-hidden true identity of the boy who inspired* The Exorcist *book and film.*

The 'True' Story behind *The Entity*: Untangling Hollywood Horror

BENJAMIN RADFORD

The 1970s were a heyday for blockbuster horror films and franchises, including *Alien*, *The Texas Chainsaw Massacre*, *Phantasm*, *Carrie*, and many more. Although it did not reach the success of movies such as *The Omen*, *The Exorcist*, *Halloween*, and *The Amityville Horror*, a paranormal horror film titled *The Entity* was a modest hit.

The "true story" behind the case involved a California woman, Doris Bither, who in the mid-1970s claimed, among other ghostly goings-on, to have been sexually assaulted by three ghosts. Bither's case inspired a 1978 novel by Frank De Felitta titled *The Entity* and a film released in 1982 starring Barbara Hershey. The case has parallels with other prominent "based on a true story" horror films—including *The Exorcist* and *The Amityville Horror*—blending themes of paranormal investigation, tormented victims, and evil spirits. It follows a template: Supposedly true supernatural events inspire a best-selling novel, which in turn inspires a hit horror film—with dramatic embellishments occurring at each stage along the way. Whatever true, documented events may have served as the kernel of a book or film are quickly overshadowed and exaggerated by novelists and filmmakers.

Despite its pop culture prominence and allegedly true backstory, the Bither case is not widely mentioned in books on "true" ghost stories or paranormal events. This is a curious oversight for a genre often eager to publicize and sensationalize dramatic ghost reports based on even the flimsiest evidence. One reason may be that the case is complex and strains credulity even for believers; another may be that because it involves alleged supernatural sexual assault, it's passed over in favor of more family-friendly (albeit frightening) fare.

The Bither Story

Doris Bither's story is by all accounts tragic. An alcoholic drug user, she had several failed marriages and lived in a squalid, condemned home with her three boys (aged ten, thirteen, and sixteen), along with a preteen daughter. Bither described a troubled life of abuse going back to her childhood. She and her sons claimed to have seen semi-transparent apparitions of roughly human shape and size in their home. Bither said she was physically and sexually assaulted by these spirits, allegedly at one point being thrown across a room into a wall by an unseen force, and one of her sons was similarly assaulted. Unable to contact the police under the circumstances, Bither described these events to a female friend. The matter would likely have ended there (chalked up to stress, mental illness, or substance abuse) if not for a random encounter at a bookstore.

As depicted in the film, Bither's friend overheard a conversation between parapsychologists Barry Taff and Kerry Gaynor, two men who worked at the University of California at Los Angeles, talking about paranormal topics. (Taff tells the same story in a 2017 DVD interview [Taff 2017] and his 2014 book *Aliens Above, Ghosts Below*.) The friend related Bither's experiences to them and asked if the pair could help the troubled woman. Intrigued, Taff and Gaynor interviewed Bither in August 1974 (not long after *The Exorcist*, which had been a best-selling novel since 1971, was released in theaters).

Taff holds a doctorate in psychophysiology and as of early 2021 describes himself on his LinkedIn profile as "foremost a brilliant, dedicated scientist, an extraordinary inventor, and expert in numerous areas of science, having appeared on TV and Radio including *Coast-to-Coast A.M.*" His associate Kerry Gaynor has a degree in philosophy and markets himself as a hypnotherapist specializing in smoking cessation.

As is often the case with haunted people, the introduction of psychics, paranormal investigators, and other self-styled ghost hunters escalated—and arguably exacerbated—Bither's situation. Where a trained psychologist or social worker might have seen a troubled woman needing help, Taff and Gaynor saw a golden opportunity to research a real haunting.

Deconstructing the Investigation

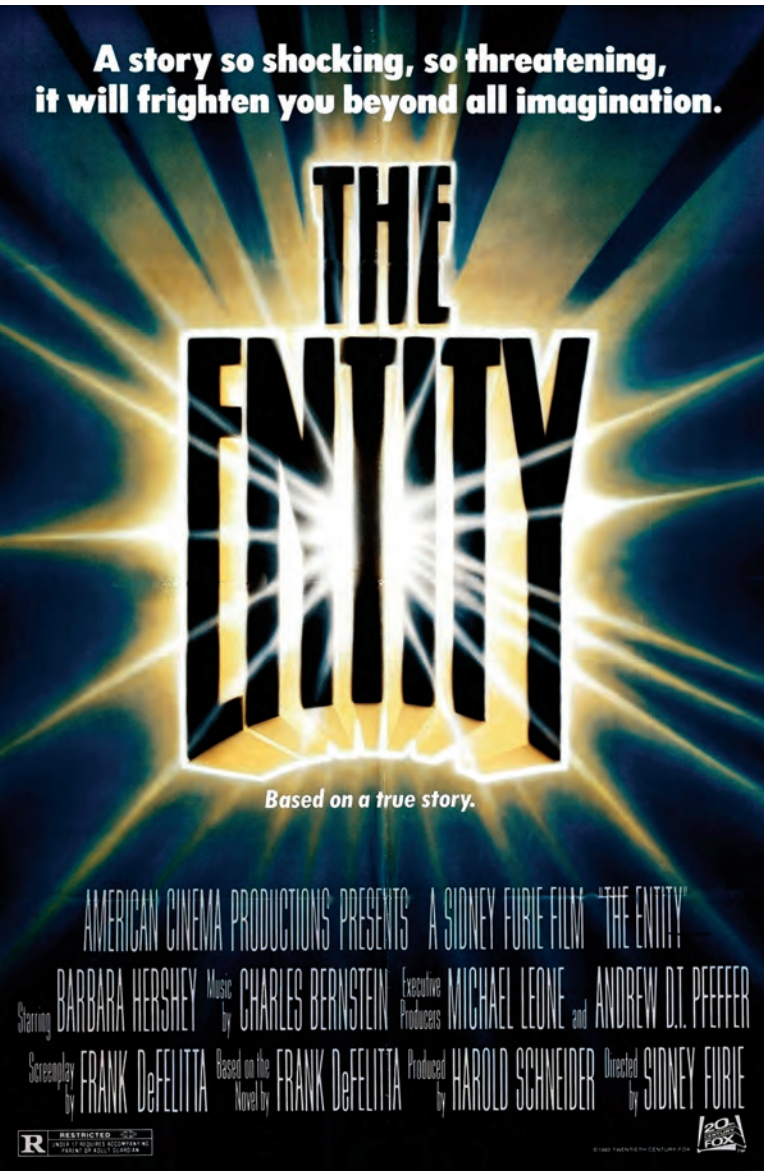
So what *really* happened? Unfortunately, the case was never competently investigated, and nearly a half-century later, it's impossible to be sure of much. Many of the key participants have since died, though Taff is still capitalizing on his involvement in the famous case through media interviews and books. There are a few sources with which we can piece together a reasonable guess at what happened—or at least what those involved *claimed* had happened—over the course of several months in 1974.

We have Taff's claims and conclusions, which can be examined with an eye toward what evidence is offered (or, more often, is conspicuously absent). There is curiously little independent corroboration of the allegedly extraordinary events, and we are forced to rely extensively (if not exclusively) on secondary sources. Taff has written about the case several times, including in his book *Aliens Above, Ghosts Below*, and his website contains a nearly 10,000-word chapter on the topic (Taff 2011). The case is complex and summarized here out of necessity; those seeking more details should consult the original sources (though additional details may not necessarily yield greater clarity).

Taff (2014) described the investigation as "Beginning on August 22, 1974, a ten-week investigation of a reportedly haunted house located in Culver City, California, demonstrated evidence that it was infested with and frequented by occurrences of poltergeist activity in the form of object movements, collectively observed apparitions, as well as cold and stench spots." More specifically, one summary notes that Taff and Gaynor

> observed displays of small, rapidly-moving balls of light on several occasions, which occurred in the presence of a woman in her mid-to-late 30s. The lights were reported to change their motion, size, and intensity in response to the investigators' requests, and to the occasional emotional outbursts of the female agent. Attempts to photograph the lights were reportedly met with no success on most occasions, although in a few rare instances, the lights were captured on film as curved arcs of light, akin to the "trails" that can appear in photos of lighted objects (whether due to motion of the camera, or to motion by the object itself). (Williams and Ventola n.d.)

The investigation, conducted in the context of the "broken-down, shabby nature of the wooden dwelling" had many of the phenomena typically associated with ghost reports: cold spots; odd, subjective sensations; a bad smell; and so on. The pair claimed to have experienced some unexplained phenomena, for example, "suddenly the cabinet door swung open. A frying pan flew out of the cabinet, following a curved path to the floor over 2.5 feet away, hitting with quite a thud." Sadly and predictably, none of this was documented. They were joined by a friend of Bither's named Candy, who claimed to be psychic and occasionally "screamed out that there was something in the corner (not that she could see, but sense)." On a few occasions, others joined in, with little or no apparent regard for investigative protocol. By far the most impressive evidence—in Taff's eyes anyway—appeared in a few photographs. During their second visit to the home, they brought additional equipment and several cameras, which, they claimed, later


A story so shocking, so threatening,
it will frighten you beyond all imagination.
THE ENTITY
Based on a true story.
AMERICAN CINEMA PRODUCTIONS PRESENTS A SIDNEY FURIE FILM "THE ENTITY"
Starring BARBARA HERSHEY Music by CHARLES BERNSTEIN Executive Producers MICHAEL LEONE and ANDREW D.T. PFEFFER
Screenplay by FRANK DeFELITTA Based on the Novel by FRANK DeFELITTA Produced by HAROLD SCHNEIDER Directed by SIDNEY FURIE
R RESTRICTED

Cover art for *The Entity* film, "based on a true story."

yielded unexplained photographs. In his accompanying article, Kenny Biddle takes a critical look at the photographic evidence offered in the Bither case and uncovers new information suggesting that there is far less to this case than meets the eye.

The most dramatic events happened when Taff and the others weren't there; Taff writes, "I will refrain from going into all the bizarre stories that were related to us for we cannot substantiate them" immediately before going into all the bizarre and unsubstantiated stories that were related to them. Again and again, Taff and his colleagues were forced to rely on what Bither *told* them had already happened.

Unable to verify her claims, the pair launched an investigation. They tried century-old techniques of ghost communication, asking spirits to create sounds or manipulate lights in response to questions (a certain number of flashes to signify *yes* or *no*, for example). The efforts were both unscientific and fruitless; as even Taff admits, to his credit, "The answers we received could not be confirmed, and never really made any sense." There were the usual ghost gadgets, including Geiger counters, but in the end the evidence remained inconclusive and ambiguous.

Spectral Sex Claims

Bither's ghostly sexual assault claims—which are perhaps the most notable and lurid aspect of her story and make it nearly unique in modern horror cinema—are a small subset of a much larger series of ghostly events claimed to have been experienced by Bither, her family, and the investigators.

Despite pseudopanicked scenes on "reality" television ghost hunting shows in which participants say they are pushed or hurt by unseen forces, claims of supernatural assault are very rare. Most people's experiences with ghosts are mundane—in fact often whimsical, benign, and comforting (see, for example, Waskul and Waskul 2016). So Bither's story, if true, is notable for that reason as well. Taff notes:

> The most intense occurrence which Doris related to us was that she had been sexually assaulted by three semi-visible beings. Two of the smaller beings or apparitions literally held her down by the wrists and ankles, while the remaining form entered her. According to Doris' testimony, this event took place on several separate occasions, each time leaving behind large and distinct black and blue wounds, especially around the ankles, wrists, breasts, and groin area of the inner thighs. (Taff 2014)

Claims of sexual relations with spirits has a long and fascinating history. In his book *Sexual Hauntings Through the Ages*, Colin Waters notes that "It is little wonder that a wide variety of hauntings are either sexual in nature or are a manifestation of overt or suppressed sexual feelings" (Waters 1993, 8). Waters catalogs dozens of (allegedly true) reports of phantom gropers, Peeping Toms, "heavy breathers," and (much rarer) outright rapes. Waters mentions a home in Edinburgh, now sadly demolished, locally known as the ghosts' whorehouse, "where people would gather [at windows] to watch … every wicked ghost and spectre in Scotland gathered there for regular sexual orgies" (Waters 1993, 23).

The logistics of ghost orgies aside, there are a handful of famous cases of alleged sexual hauntings, including the Bell Witch Legend of Tennessee (see, for example, Radford 2020 and Nickell 2014). Reports of groping ghosts are not as rare as one might think. Many reports of unseen (or barely seen) presences are described by people late at night in bed. People who experience these events often describe being terrified, paralyzed, touched, and held or pushed down by some unseen force. Most are also convinced that they were fully awake at the time and adamantly refuse the suggestion it was a dream or sleep-related hallucination. Reports of ghostly assaults exactly match this phenomenon and are reminiscent of the succubus and incubus, sensual female and male demons of medieval lore

that sexually attack people as they sleep.

This phenomenon is not limited to lusty, dusty history but occasionally referenced in modern mainstream media. For example, supernatural sex made national news in 2020 when a doctor who President Donald Trump praised, Dr. Stella Immanuel—later dubbed Trump's "demon sperm" doctor—claimed that gynecological problems are caused by (presumably invisible) demons having sex with women while they sleep. Other prominent people have come forward with similar claims. In a 2012 interview with Ryan Seacrest, pop star Ke$ha talked about the inspiration for her song *Supernatural*: "I had a couple of [sexual] experiences with the supernatural. I don't know his name! He was a ghost! I'm very open to it." Actress Natasha Blasick, star of several ghost-themed films, described a paranormal paramour in a 2014 interview: "I could feel that somebody was touching me and the hands were pushing me against my will and I could feel the weight of the body on top of me. I couldn't see anybody but I could feel the pressure, the energy, the warmth pushing in different directions" (Moye 2014). Blasick described it as "really pleasurable" and was delighted when the unseen entity returned the following month.

There are surely countless more unknown men and women who have had such experiences. It's impossible to know what, exactly, these people experienced, but some psychological phenomena can give the impression of a ghostly lover (or attacker, depending on the context and interpretation). These experiences—sometimes scary, sometimes sexy, but always vivid and realistic to the experiencer—are the result of normal brain misperceptions and illusions. Folklorist David Hufford (1982) estimates that about 15 percent of people experience being assaulted in their sleep by an unknown entity at some point in their lives.

Additional evidence for a psychological explanation for Bither's experiences can be found in an article in *Mental Health, Religion & Culture* noting:

> The family's circumstances appeared stressful and dysfunctional. … Indeed, the investigators observed poor relationships between Doris and her children, there was fighting among the siblings. … The son further claimed … that he and his siblings were psychic, noting that in different environments throughout their lives they had occasionally seen "shadows and spirits." (O'Keeffe et al. 2019)

The researchers also noted that "While the Doris Bither case was extreme and sensational, its phenomenology underscores why the relation between paranormal ideations and psychological wellness or symptom perception is an important and burgeoning area of study." They suggest that Bither represents what they call "Haunted People Syndrome, a condition in which percipients within the general population who invoke labels of ghosts or other supernatural agencies to explain a specific set of anomalous events that often are perceived recurrently" (O'Keeffe et al. 2019).

In fact, Barry Taff himself doesn't believe Bither was spectrally assaulted, writing:

> Unfortunately, Doris's claim of 'spectral rape' could not be substantiated due to her failing to report the incident to medical or other authorities. The fact that these alleged instances of paranormal rape occurred several weeks prior to our initial arrival prevented us from observing her already healed bruises … Contrary to what many people believe, the case of Doris Bither … was not, in my professional opinion, the result of spectral rape … but a rather disturbingly real poltergeist outbreak. (Taff 2014)

Adopting a pseudoskeptical stance, Taff implores readers:

> Remember, extraordinary claims require extraordinary evidence, and while there was plenty of evidence that we were dealing with real paranormal phenomena, it very likely had nothing whatsoever to do with incorporeal sex, except in the mind of Doris and her children. … It was apparent from the outset that Doris was a deeply troubled woman whose claims of spectral rape were due in large part to extreme emotional distress coupled with an overactive imagination and libidinous fantasies. (Taff 2014)[1]

Unreliable Non-Eyewitnesses

All involved agree that Bither was a deeply troubled woman whose psychological problems were exacerbated by drugs, alcohol, and dire circumstances. Even Taff (2014) acknowledges that he and Gaynor elided Bither's mental status and history:

> Doris was very evasive and somewhat cryptic regarding her background, so much so that she refused to even tell us her age. … Had we pushed Doris hard to reveal more about her hellish past, such efforts on our part might have pushed us right off the case. Had we even attempted to secure the type of background information we currently collect, such as medical, psychological, family psychodynamics, prescribed medications (names of meds, dosage and duration) as well as recreational drugs and alcohol usage, Doris would surely have shown us the door from the outset. We had no way of knowing just how utterly disturbing of a life she really had led.

(This rationalization is often invoked by UFO and conspiracy buffs who choose not to press their "top-secret anonymous sources" for evidence of their claims, lest the "insider" source stop cooperating.)

To a skeptic—and especially given the stark lack of any good evidence—Occam's razor suggests the most likely explanation is the most obvious one: Bither, like many ghost experiencers, imagined most or all of her spectral encounters. Some events, such as ordinary accidents, tripping, or falling (as might happen when one is drunk or under the influence of drugs) might have been interpreted as mysterious and malicious in light of an assumed haunting. It's not clear what, if anything, Bither and others experienced. This is not to say that people who are suffering from mental illness and under the influence of a cocktail of drugs cannot *also* experience ghostly visitations, but merely that her circumstances alone offer a plausible explanation—especially because ordinary psychological priming

by itself can cause people *without* mental illness or drug use to report ghostly experiences (see, for example, French and Stone 2014).

No Spectral Sex—Instead a Haunting

Barry Taff, having somehow ruled out hoaxing and psychological disturbance to his satisfaction, offers three apparently plausible possibilities to explain the events (including that "unconsciously released energy of an unknown variety affects surrounding matter and energy") but finally decides that "In the simplest terms and contrary to the popular media hype, *The Entity* case was not, in my opinion, an instance of haunting or discarnate intelligence, but … a poltergeist manifestation." Taff seems to dismiss Bither's reports of spectral sexual assault but gives credence to her other supernatural claims.

On the whole, the proceedings have the markings of amateur investigation dressed up with the imprimatur of a UCLA affiliation and a participant with a doctorate. There was little or no effort by the investigators to establish a protocol, keep people from contaminating the scene, or detect—much less prevent—fraud. The fact that Taff not only believes he is psychic but suggested that a séance would be a valid investigative technique speaks much about his credibility. Taff also claimed to have investigated "some 3,500 cases" of ghosts, hauntings, apparitions, and poltergeists over the course of about thirty years—an average of 117 cases a year, or *one every three days!* If true, even more astounding than his prodigious productivity is the apparent absence of good evidence to show for it.

Taff's lack of evidence would be less of an issue if others corroborated his story. Curiously, despite "over fifty" people allegedly having been present at one point or another, none seems to have come forward with accounts or evidence. I don't doubt that others were involved, but the lack of independent corroboration is curious. Surely given the notoriety of the case, at least a few of the dozens of eyewitnesses to astonishing paranormal activity would have parlayed their participation into a book, article, or nominal fame. And, for that matter, with so many camera-toting witnesses, why aren't there dozens of "unexplained" photos for Taff, Gaynor, and Biddle to examine?

Despite its "scientifical" veneer, *The Entity* investigation is rife with gross violations of investigation protocols, skeptical principles, and critical thinking. Taff revives the hoary "If I can't explain it, then no one can" chestnut, asserting self-evidently that what they documented "cannot be explained or accounted for by any conventional physical, scientific theory or model."

It's little wonder that *The Entity* case has received relatively little skeptical scrutiny despite its notoriety, because there's far more sizzle than steak. Many "true story" cases of alleged hauntings involve people who are scared, desperate, and in some cases mentally ill. Ghost hunting duo Ed and Lorraine Warren, lionized in the *Conjuring* film franchise, had no reservations about exploiting fragile and disturbed people for publicity and a good story. There's no reason to think that Bither's story is an outright hoax. Instead, in reviewing the wholly uncorroborated descriptions of the events that inspired *The Entity*, it seems like an otherwise unremarkable mix of psychological disturbance, power of suggestion, and investigative incompetence by well-meaning people who sincerely thought they'd stumbled upon an amazing case of paranormal activity.[2] ■

Notes

1. Taff (2014) writes that "The psychodynamic environment within Doris' household was extremely intense and anxiety ridden, with overtones of animosity and belligerence underlying its nature. From a psychoanalytic perspective, it is interesting to note that Doris' reported attacks and alleged rapes were by three male 'beings,' the same number of male children she has." Taff isn't the only person who suspected that Bither's claims about spectral sex may have been fantasies; according to Daniel Kreme's 2015 book *Sidney J. Furie: Life and Films*, *The Entity*'s original screenplay contained a subplot about Bither's character's incestuous fantasies involving her children, specifically her son Billy. It didn't make the final cut of the film.

2. The fact that I suspect that the principal participants likely were and are sincere should not be taken to preclude the possibility of hoaxing. Many sincere believers (in UFO, Bigfoot, and especially miracles) have been caught faking evidence in support of their beliefs. Often they see nothing wrong with fudging phantom photos or making a statue weep if it might bring more believers to a cause they're sure is real.

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A Closer Look at the *Entity* Photographs

KENNY BIDDLE

Left and center are "entity" Polaroid photos. Right is a "control" photo.

I received a call one night from my colleague Ben Radford asking if I'd be interested in working on a project with him. He was working on a piece concerning the Doris Bither haunting, better known as *The Entity* case (see the preceding article). While focusing on the facts behind the story, he asked if I would look at several well-known photographs associated with the case and write up a companion piece. This being one of the cases on my paranormal bucket list, I enthusiastically agreed.

There are two sets of photographs associated with this case: a series of Polaroids shot during one visit to the Bither house by parapsychologists Kerry Gaynor and Barry Taff and two 35 mm print photos taken during a later visit. The Polaroids were captured first, so I will begin with those. On their second visit to Bither's residence, Gaynor and Taff brought two cameras with them: a Polaroid SX-70 instant camera and a Honeywell Pentax SLR loaded with high-speed infrared film (Taff 2011). The infrared film in the Pentax SLR was inadvertently exposed due to the duo's own acknowledged carelessness (Taff 2011), so our focus will be on the Polaroid photographs they took.

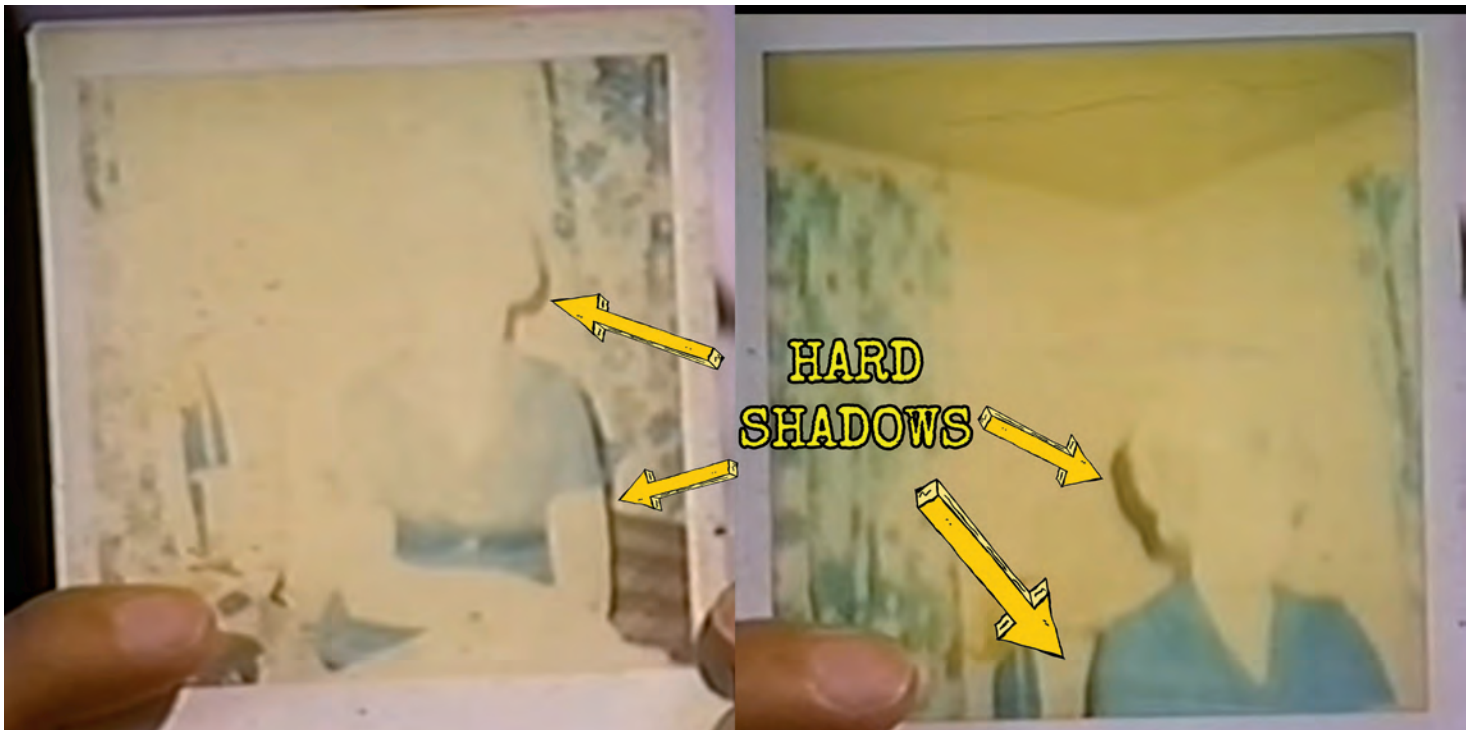
The first issue is the identity of the woman who appears in these images. Many paranormal-themed websites identify the woman as Bither herself, such as in this quote from best-selling mystery author Stacy Green (2012): "Gaynor also shows the famous Polaroids he snapped when Doris claimed the entity was in front of her face." However, this is incorrect. In Taff's book *Aliens Above, Ghosts Below*, he identifies the woman as Candy, a "psychic" friend of Bither who was visiting on this day (Taff 2011).

According to Taff's account, Candy shouted out several times during the night, indicating to others where the alleged entity was. Each time Taff or Gaynor would fire off the Polaroid camera. These photographs, six out of the thirteen mentioned, were overexposed when fully developed. Six additional photos, claimed to have been taken as "control" images (that is, when there was no indication of an entity), came out normal. Is this evidence of a supernatural entity? Nope, it's more likely just poor photography.

Is this evidence of a supernatural entity? Nope, it's more likely just poor photography.

Three Polaroids from this series really stood out to me after watching Kerry Gaynor showcase them on an episode of *Sightings* (Cowen 1993). Gaynor explains that Candy had shouted out, "It's right in front of my face!" twice, referring to a spirit only her keen psychic powers could detect. Both times a Polaroid photograph was taken, and both times the resulting photograph was overexposed. Candy's face, according to Gaynor, was "completely obliterated." However, the control photo (which he took when Candy said the entity was gone) came out normal.

There is an obvious problem when comparing the three images side-by-side: the two "entity" photos made use of the flash, while the control image used only the ambient light in the room. In the two entity photos, we can clearly see hard shadows cast by Candy's silhouette. Hard shadows are very distinct, appearing in sharp contrast to the subject and the



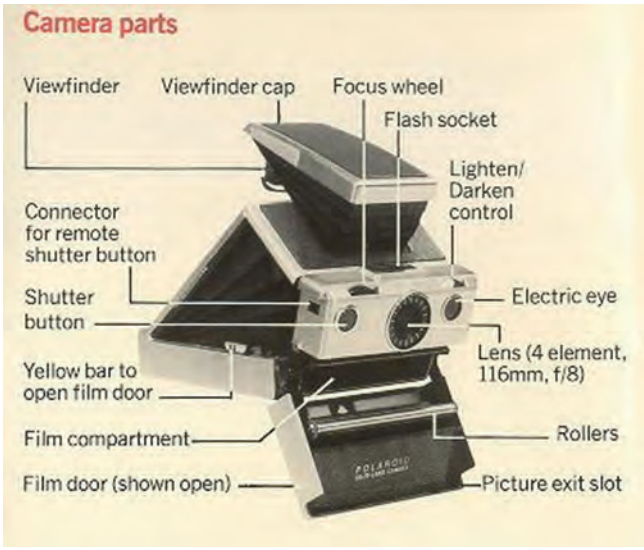
background. In the first image (above left), a hard shadow appears along the right side of Candy. In the second image (above right), the hard shadow appears to the left of Candy. Both hard shadows are consistent with the use of a flash bar on the Polaroid camera, which features single-use bulbs (five on each side). However, the "control" image is dark overall. Although it contains some soft shadowing from ambient light, there are no indications a flash fired. In a nutshell, the three photographs were not taken under the same conditions, making comparisons difficult or impossible—and invalidating their use as "controls."

I wanted to get a second opinion on this, so I reached out to my friend Paul Michael Kane, an award-winning professional photographer. After reviewing the photos, he agreed that the two "entity" photos used a flash and were overexposed, while the control image was lit only by ambient light, causing it to be underexposed. Kane pointed out the lack of bright highlights in the control photo, which indicates a flash bulb either did not fire or was not used.

We also discussed the "electric eye" of the Polaroid SX-70 camera. According to the owner's manual, this "sets short exposures in bright light and longer exposures in dim light." Although this means exposure control is automatic, a user can still manually adjust the exposure via a black and white dial directly above the electric eye. Rotating toward the black side darkens the exposure; rotating to the white side will lighten the exposure.

I bring up this point because the location of the dial would allow for easy—even accidental—manipulation of the exposure. A similar dial (all black) on the other side of the camera's face is used to control focus. Someone who is unfamiliar with the camera might inadvertently adjust the wrong dial. According to Barry Taff's own account, they had already ruined the infrared film through their own carelessness, so improper handling is clearly a possibility. Because only the alleged "entity" photos were overexposed (with flash), I suspect the change in exposure and flash use was not entirely due to carelessness.

I noted that during an episode of *Sightings*, Gaynor makes an interesting comment while displaying the Polaroid photos



The original Polaroid SX-70 manual describes the function of the light/dark control (exposure).

Because only the alleged "entity" photos were overexposed (with flash), I suspect the change in exposure and flash use was not entirely due to carelessness.

to the camera. When he shows the control photo, he states, "I waited until she said it [the entity] was gone, and I took the final picture. And this is a perfect, normal picture. It's just dark because we didn't adjust the setting" (Hall and Cowen 1992). As noted, if he were taking a control photo, it should have been taken under the same settings as the previous photos; Gaynor's statement suggests they may have been *changing the exposure setting between shots*, because that is the only adjustment setting (besides focus) they could change.

I contacted Gaynor concerning this odd comment. He responded, "The pictures were shot within about thirty seconds of each other. No adjustments were made. Also remember her exact words were 'it's right in front of my face.' The face was obliterated, but the rest of her body was not. In addition, we could see the curtains behind her at the same level as her head." Despite his opinion, the curtains are overexposed as well, but due to their darker color scheme and slightly farther distance, they are not completely washed out. Also, Candy's skin is one of the lightest colors in the scene and therefore would be washed out more than her dark blue dress. I requested clarification about these concerns with Gaynor but received no further response.

Taff and Gaynor describe a steady increase of activity over the next few visits to Bither's home, mainly the manifestation of multiple light anomalies. These lights are described as "moving, pulsing flashes of light … lime green in color … three-dimensional in nature … which were not stable in size or luminosity" (Taff 2011). The focus of the parapsychology group, which at this point had grown to over thirty individuals, had switched to photographing these strange lights.

Taff also describes a much larger operation being implemented by his group. In his report Taff states:

> Our fifth visit to Doris' house resulted in a large-scale magnification of all phenomena. We began by duct taping large black poster boards up on the walls and ceiling of the bedroom, all of which were numbered and identified with a magnetic orientation. White duct tape was placed between the dark panels that formed a grid network, like graph paper, therein providing us with a reference for further attempts at photographing the lights. Black poster boards were also used to seal off all the light entrances into the bedroom that rendered the environment almost pitch black. (Taff 2011)

He describes this same setup in *The Entity Files*, a featurette included on the DVD release of the film (based loosely on the story).

Two photographs from this visit are presented as evidence of the supernatural lights. Both images, taken inside Bither's bedroom, show two "brilliant arcs of light, one essentially framing Doris" (Taff 2011). During his interview on *The Entity Files*, Taff states that Bither was "cowering on the bed beneath the lights that were flying around her in a mad fray" (Martin 2005). Yet the photo does not in fact show Bither "cowering" but rather sitting on the bed looking, if anything, a bit uninterested as other team members sit idly.

Taff points out that one of the arcs of light crosses over a

Author's recreation demonstrating how flash use and exposure control could have caused the *Entity* polaroid photographs.

ninety-degree corner in the bedroom—yet the light does not in fact bend with the corner. This indicates the arc of light is floating in space rather than being light cast onto the walls. Taff and Gaynor both agree these arcs of light are the result of the three-dimensional, free-floating lights that were moving too fast for the camera's set shutter speed. What they fail to point out is that in this photograph, the arcs of light *also cross over several people in the room*, most notably the small arc on the left appearing before the woman's head. This indicates the arcs of light are in the space between these people and the camera lens—*not* floating above Bither on the bed.

After reading Taff's report, I noticed a huge discrepancy between his description of events on this visit and the resulting photographs: there are no black poster boards, white duct tape (creating grids), or numbers and magnetic orientation identifications on the walls. Taff told us these objects were installed prior to the supernatural light show (and they were still up when they left that night), yet they are curiously nowhere to be found in the photographs.

The photo does not in fact show Bither "cowering" but rather sitting on the bed looking, if anything, a bit uninterested.

I focused my attention on the two arcs of light within each of the photographs. My first impression was that these were strands of hair caught in the flash, which would cause the same effect when photographed too close to the lens. The hair is out of focus and therefore shows up much thicker than it really is. Using a strand of my wife's hair, I recreated the effect, shown on p. 44.

Taff states, both in his report (2011) and on *The Entity Files*, that there were over thirty people crammed into this small house, mostly within this bedroom. He also notes in his book how they "became increasingly aware of the broken-down, shabby nature of the wooden dwelling that had been twice condemned by the city" (Taff 2011). These two details bring up the possibility of hair, fibers, or other similar debris getting onto and/or in front of the equipment, especially when thirty-plus people are moving about in such an enclosed space.

In the episode of *The Entity Files*, Taff states these photographs were sent to Adrian Vance, the West Coast editor of *Popular Photography* magazine, who could not explain how the arcs of light were produced. Also, in an episode of *Sightings: Ghost Contact*, the narrator (Tim White) goes a bit further, stating, "the negative of this photo was authenticated by *Popular Photography* and was the only alleged ghost photo ever

One of two black and white images showing arcs of light. Doris Bither is sitting on the bed. Note the lack of the black poster boards, white tape, and panel identifications Taff claimed were in place when this photo was shot.

Author's recreation of a single strand of hair in front of the lens, reflecting the light of the flash.

published in the magazine." Vance published an article in the May 1976 issue of *Popular Photography* that included one of these photographs, but the article failed to mention whether the magazine "authenticated" the negative. As for Vance giving his opinion on whether the photo shows an apparition, he merely writes, "it now appears (to them) that they had some success" (Vance 1976). This does not appear to be an enthusiastic endorsement of the photo's authenticity as depicting some unknown energy.

I again reached out to Paul Michael Kane for his expert opinion. He mentioned the "arcs" could also be caused by poor film processing methods, specifically if part of the film strip made contact with another part during development. However, if Vance did inspect the negatives, this should have been something he would have picked up on. After further discussion, Kane agreed that these arcs were most likely caused by a thin object close to the camera, due to the overexposure and out-of-focus nature of the anomalies. The way the light fades at the ends of the arcs is also indicative of the ends falling out of view of the lens.

In closing, the photographic evidence presented for this case suffers from operator error and/or equipment misuse and possibly of deliberate manipulation of data. The photos contain sufficient clues as to how they were created and do not support the hypothesis that supernatural entities were captured on film in Doris Bither's home. ■

Acknowledgements

Thanks to Ben Radford for locating a copy of the *Popular Photography* article and Paul Michael Kane for sharing his extensive knowledge of photography.

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Demoniac: Who Is Roland Doe, the Boy Who Inspired *The Exorcist*?

JD SWORD

If recent films such as *The Conjuring: The Devil Made Me Do It* are any indication, there's no shortage of fascination with movies about demons and demonic possession. Perhaps looking to follow up on the success of their *Insidious* film franchise, last year Blumhouse Studio announced it would be teaming up with Morgan Creek Entertainment to produce a reboot of William Friedkin's 1973 classic, *The Exorcist*. Based on a novel of the same name by William Peter Blatty, *The Exorcist* has developed quite a reputation over the years not just for the film itself supposedly being cursed (that's a whole other story; see, for example, "Hollywood Curse Legends" in the November/December 2017 SI) but for notably being "based on a true story."

Joe Nickell did a thorough job exploding many of the myths and misconceptions around the "true story" in his article "Exorcism! Driving Out the Nonsense" from the January/February 2001 Skeptical Inquirer. Not surprisingly, though, many continue to uncritically treat *The Exorcist* as though the true story were a supernatural mystery. An article from movieweb.com asks, "Should *The Exorcist* Reboot Follow the Chilling True Story That Inspired the Classic?" In the two decades since Joe Nickell's article, new information has come to light regarding the case, which, evidently, many choose to ignore.

The short story is that, while he was a student at Georgetown University, Blatty saw an August 1949 article in *The Washington Post*, "Priest Frees Mt. Rainier Boy Reported Held in Devil's Grip" by Bill Brinkley, about an exorcism performed on a fourteen-year-old boy from Mount Rainier, Maryland. As the story goes, the family of this boy, referred to pseudonymously as "Roland Doe" or "Robbie Mannheim," started hearing strange rapping and scratching noises from his bedroom walls, objects would fly across the room, and allegedly Roland's bed moved while he was asleep—classic poltergeist phenomena. The family (or at least the mother) believed these goings-on were the work of Roland's recently deceased "Aunt Tillie," who was a spiritualist and had taught the young boy how to communicate with spirits through a Ouija board. Initially, the family sought the help of a Protestant minister, Reverend Luther Schulze, but when things grew worse, they turned to the Jesuit communities of Washington, D.C., and St. Louis. Roland was subjected to medical and psychiatric examinations, which failed to find anything abnormal that might explain the allegedly paranormal phenomena. After that, a Jesuit priest, Father William Bowdern, was brought in to perform more than twenty exorcisms on Roland over a period of two months, finally freeing him of the demonic influence. Father Bowdern was assisted by fellow priests Father Walter Halloran, Father Hughes, and Father Raymond Bishop. Bishop kept a diary of events that Blatty would base his novel on and would be reprinted later in Thomas Allen's book *Possessed*.

Credit: Garrett Ziegler

Linda Blair played a possessed girl in 1973's *The Exorcist*.

I began exploring the story while researching for my podcast, *The Devil in the Details*, and found that folks such as investigative journalist Mark Opsasnick, blogger Mike Madonna, and Dr. Sergio A. Rueda had already thoroughly researched the case and cast doubt on many of its claims, as well as having deduced the real identity of Roland Doe. Opsasnick determined the family wasn't from Mt. Rainier at all but were in fact from Cottage City, Maryland. Opsasnick spoke to Mt. Rainier resident Dean Landolt, who stated he was "very good friends with Father Hughes, the priest involved in the case. … Father Hughes told me two things: one was that the boy lived in Cottage City, and the other is that he went on to graduate from Gonzaga High and turned out fine" (Opsasnick 1999).

Consulting an article for *Fate* magazine from January 1975, Opsasnick confirmed that the boy's date of birth was given in the article as June 1, 1935. From that date, Opsasnick estimated Roland's graduation year would likely be 1954. After obtaining a copy of the 1954 Gonzaga High School yearbook, Opsasnick checked for any graduates who were both members of St. James Church in Mt. Rainier (the church to which Father Hughes belonged) and either lived in Mt. Rainier or

The boy who inspired *The Exorcist*

Cottage City. He found only five students who fit those criteria. Checking Maryland records for their birth dates, Opsasnick narrowed the list down to only one student who lived in Cottage City and had been born on June 1, 1935: Ronald E. Hunkeler. Further confirmation came from Opsasnick speaking to T. Weston Scott Jr., who had lived in Cottage City since 1919 and was a lifelong member of the Cottage City-Colmar Manor Fire Department. When asked about the exorcism, Scott confirmed "The boy involved was [Rob Doe] and he lived at 3807 40th Avenue."

In his 1999 *Strange* magazine article, Opsasnick chose not to reveal Ronald's identity, "for a number of legal reasons" as he explained to me. However, knowing the address made it possible to deduce Ronald's identity. As author Kyle T. Cobb explained to me, "TW Scott confirmed the address without naming the boy. The address confirmed the last name and parents. The school annuals and interviews with classmates verified the timeline and identity." In addition, since the publication of the article in *Strange*, more than just the full twenty-nine-page diary of Father Bishop had become public knowledge. In his book *Diabolical Possession and the Case behind the Exorcist*, Sergio Rueda interviewed Rev. Schulze on July 25, 1990, and asked him, "Was the name of the family, the Hunkeler family?" to which Schulze replied, "Yes" (Rueda 2018).

Not wanting to believe everything I read online, I knew I had to find some evidence corroborating the claims that Ronald Hunkeler was, indeed, Roland Doe. For starters, the yearbook photos circulating on the internet do in fact match the yearbook photo that Opsasnick included in his original article, though he blurred out the face to protect Ronald's identity.

More important, the yearbook photo confirms the address of 3807 40th Street, Cottage City. In addition, the house at 3807 40th Street matches the description from the original *Washington Post* article of a "suburban Maryland home," something that the house at 3210 Bunker Hill Road, Mount Rainier—often claimed to be Roland Doe's house—does not. Finally, with the help of colleague Kenny Biddle, Ancestry.com information for Ronald Hunkeler reveals his parents were Edwin Hunkeler and Odell Coppage. This matched the description from Fr. Bishop's diary of "Roland Doe. Son of Mr. and Mrs. Edwin Doe, middle class Washington suburban development" (Erdmann 1975). Furthermore, Edwin Hunkeler had a sister, Mathilda Hendricks, who would be the "Aunt Tillie" mentioned. Ancestry.com confirmed that Ronald Hunkeler was indeed born June 1, 1935, and died just last year on May 10, 2020.

Finally, the last two pieces of evidence, which are perhaps the most compelling of all, come from Mark Opsasnick and Father Raymond Bishop. When I asked Opsasnick if he now felt comfortable confirming whether his investigation had uncovered that Ronald Hunkeler was in fact Roland Doe, because Ronald had since died, he replied, "The Haunted Boy is Ronald Hunkeler. That's a fact." The last piece of evidence was a cover letter Father Bishop submitted along with his diary account of the exorcism, which was given to the Rector of the Alexian Brothers Hospital. Although Father Bishop was careful to conceal the identity of Ronald and the Hunkeler family in the diary itself, in the letter he refers to both "the Hunkeler family" and "Ronald." I found a copy of the letter on CampionForever.org, a newsletter dedicated to the Campion Jesuit High School, which closed in 1975. Father Bowdern was the school's president, and Father Halloran was a student. Although I have not seen a physical copy of the letter that has not been redacted, the majority of the letter on the Campion website is an exact match for a physical copy of a redacted version of the letter found on the website biblicalcatholic.com.

While we'll never know all the details or be able to definitively prove that nothing supernatural or diabolical took place in 1949, there is overwhelming evidence to suggest the sensational account of the exorcism of Roland Doe, a.k.a. Ronald Hunkeler, is more fantasy than fact. For one thing, Father Raymond Bishop was not involved with the case from the very beginning but was brought on once the decision had been made to perform the exorcism on March 9, 1949. Therefore, in writing the Background of the Case, Father Bishop would have had to rely on *someone else's account* of the events from January 15 until March 9. This calls into question the accuracy of secondhand information as well as the reliability of the primary sources. So should a reboot of *The Exorcist* follow the "chilling true story?" My answer is "No," because the true story is neither chilling nor likely true. ■

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The Devil Went Down to South Carolina? A Secret History of Witchcraft in Fairfield County

In the wake of American independence, founded on Enlightenment principles, a witch panic punctured the peace in a quiet American town. Three citizens were found guilty and tortured.

KIRK MISHRELL

Just north of Columbia, South Carolina, lies the little-known town of Winnsboro. Often called the "Charleston of the Upcountry," this quaint small town is rich in historical tradition. Victorian buildings are scattered throughout the city, and much of the business district is listed in the National Historic Register. One can view the town clock, visit the Railroad Museum, or experience southern hospitality at a relaxing bed and breakfast. On the surface, Winnsboro appears to be a quiet and picturesque southern community.

Unlike most other southern towns, however, Winnsboro harbors a disturbing eighteenth-century secret. In 1792, the Winnsboro area was plagued by witchcraft. A century after Salem and 300 years after the publication of the *Malleus Maleficarum*, a witch panic took center stage as superstition dominated the American embodiment of the Enlightenment. Livestock died, women levitated, and men morphed into animals. Spells were cast, people were cursed, and Satanic masses were held.

As claims of the supernatural accumulated, confused residents grew desperate for answers. Dominated by mob rule, Hending Smith, Mary Inglemen, and Sally Smith were arrested for witchcraft in Fairfield County. As punishment, they were tortured and burned for their crimes. When the pandemonium finally ceased, three citizens of our early republic were left with significant injuries and lasting emotional and physical scars.

To this day, the people of Fairfield County still talk about the events that unfolded nearly 230 years ago. Old spooks and ghost stories make for good conversation on the streets of Winnsboro. Furthermore, some locals claim the spirit of Mary Ingleman haunts the Fairfield County Courthouse, waiting and plotting her revenge.

Although these stories are entertaining during the Halloween season, how much do we know about the events that took place in fall of 1792? Did supernatural phenomena really take place, as many locals believed? Or can we successfully explain these strange events with modern science and historical analysis?

What follows is an examination of the events that trans-

pired in 1792 and a methodology to debunk claims of supernatural witchcraft. To date, there are three sources that detail the strange happenings that took place in Fairfield County, South Carolina. Most information comes from a manuscript written by Philip Pearson, transcribed sometime in the mid-nineteenth century. An exact chronology of the events is difficult to piece together, but I will do my best to place the alleged events in their appropriate historical context and offer explanations for the paranormal occurrences. Furthermore, the witch panic in 1792 is a historical anachronism. The apex of witch panics culminated within decades of the Protestant Revolution. For this to happen in the wake of American Independence (a movement based on Enlightenment principles) is truly an anomaly.

In many ways, however, the events serve as a metaphor for the division between Enlightenment principles and superstition. It seems appropriate that we witnessed a clash between reason and fantasy only a few years into our fledgling republic. The dichotomy between skepticism and superstition, as we know, continues well into the twenty-first century. The events of 1792, unfortunately, were a portent of future conflicts between these combative groups.

Illness and Death of Livestock

According to Philip Pearson, author of *History of Fairfield County, South Carolina*, witches had inhabited Fairfield County for decades. However, they were largely innocuous; their spells were viewed as mere pranks rather than *maleficarum*. But in 1792, these pranks elevated to noxious levels that caused chaos within the community.

The first "paranormal" event involved community livestock. Many farm animals inexplicably became sick and died. Per the testimony of Adam Free, Mary Ingleman was the perpetrator; she elevated a cow off the ground and subsequently slammed it down, thereby breaking its neck. Reportedly, the same cow began to lactate blood from its udder.

There are several reasons livestock might suddenly die. In fact, inexplicable death of livestock sparked many witch panics throughout history. Essex witches, for example, were known to drown oxen and drive sow psychotic (Hickey 1990, 132). In 1566, Agnes Waterhouse was said to have a cat, named Satan, kill hogs, cows, and geese and thwart dairy production (Gibson 2004).

The likely cause of illness in livestock was toxic plant consumption. Plants that contain high levels of alkaloids, such as ryegrass, can affect the wellbeing of many farm animals (Hickey 1990, 132). Furthermore, ryegrass grows in cooler seasons in South Carolina. It could have been consumed by livestock during autumn, when other fodder was limited due to seasonal temperature changes.

Another possibility is that Fairfield livestock consumed plants heavy in glycosides. Cyanogenetic glycoside intoxication mimics reactions to that of cyanide poisoning (Hickey 1990, 132). Victims can foam at the mouth and suddenly die. Not only are glycosides common in many grass types, but plants such as foxglove and oleander also contain glycosides and grow in many parts of South Carolina.

An alternative, of course, could be the intentional sabotage of another's livestock. For example, in the late sixteenth century, Alice Nokes of Lambourne was found guilty and subsequently hanged for "attacking a horse" as a revenge plot (Gibson 2004). Although the chemical components of toxic plants were not well understood, eighteenth-century commoners could have been privy to certain herbal poisons. It is possible a dispute between neighbors resulted in the intentional killing of another's livestock via poison or physical abuse.

Many early Americans depended on livestock for economic survival. Cattle, swine, and other animals were a source of food, clothing, and trade. Their waste could be used as fertilizer to augment crop production. To lose one's livestock was an enormous economic setback and could financially bankrupt a family and their homestead.

Germ theory and modern medical diagnostics were unknown to early Americans. For example, we now know animals experience psychosomatic symptoms when confronted with threats. Chickens can stop producing eggs, pigs may stop breeding, and milk production in cows can decrease when under distress (Bever 2012, 38). Animal trauma and anxiety can even affect the taste and color of meat. Animal stress can lead to a "rapid breakdown of muscle glycogen" (Freund 2011). As a result, the meat lightens in color and turns acidic in taste (Freund 2011).

In addition, it is not uncommon for cows to produce milk containing elements of blood. Mastitis and other bacterial infections can cause inflammation to the mammary gland, triggering soreness and redness. As a result, blood and pus can contaminate milk production (Casal 2015).

Considering the socioeconomic and survival factors linked to livestock, it is only natural that early Americans looked for answers in an attempt to thwart future illness and death. Livestock was more than a commodity; it was a means of subsistence. A dairy cow suddenly ceasing to produce milk or abruptly dying was a potentially life-changing event. Early farmers found explanations within the parameters of their historical time and space. In a society inundated with superstition, *maleficium* becomes a logical explanation.

The Power of Curse

In the Fall of 1792, the Henley sisters of Fairfield County began to exhibit strange behavior that frightened their community. According to one account, they were both "bitten on the neck and shoulders" then "stuck over with pins and splinters" (Pearson n.d., 6). Additionally, the girls appeared to have been possessed by malevolent spirits. The "exertions of four strong men" could not tame the remarkable strength of the Henley sisters. According to another testimony, both were "rising up and clinging to the ceiling."

Also, Mary Ingleman supposedly placed an odious hex on Martha Holly, causing her to violently vomit "balls of hair with pins sticking out" (Pearson n.d., 8). Splinters and pins were stuck over her neck and shoulders that significantly "deprived her [of] peace and comfort" (8).

While it is impossible to diagnose Holly and the Henley sisters with absolute certainty, any number of ailments could have afflicted these girls. A likely possibility is that these girls were suffering from ergot poisoning, causing significant hallucinations and disorientation. Ergot is a fungus that grows on grains and can mimic the effects of LSD (Horgan 2020). It can also cause muscle spasms and crawling sensations on one's skin.

Although difficult to know for certain, Mary Ingleman may have given ergot-infested bread (accidentally or intentionally) to some of the victims. This explanation might clarify the complaint made by Jacob Free, grandson of the accused. According to Jacob:

> His grandmother turned him into a horse and rode him six miles to Major Pearson's apple orchard on [the] Broad River. Whilst she was filling her bag with apples, his eye was attracted [to] the beautiful red apples that hung over him. He put up his long horse-head to obtain a stealthy supply, and whilst attempting to do so, she drove a hand into his cheek, from the effects of which he did not soon recover. (Pearson n.d., 8–9)

Ergot thrives in warm and wet climates, and the hot and humid summers in midland South Carolina can certainly produce it. Perhaps Ingleman gave her grandson some toxic bread, causing Free to experience severe delusions.

Any number of mental illnesses could cause such aberrant behavior. The Henley sisters might have suffered from schizophrenia, schizoaffective disorder, PTSD, or borderline personality disorder. Dementia or Parkinson's Disease may have affected their behavior, causing hallucinations.

Finally, one cannot discount the power of belief. In a society deluged with superstition, if people believe they are recipients of a curse, certain somatic aliments can occur. In what psychologists call *somatoform disorders*, physical illness can be a byproduct of mental instability. If one believes they have been bewitched, physical symptoms such as vomiting, diarrhea, pain, and sexual dysfunction can develop (Bever 2012, 12). Chronic anxiety can cause severe insomnia, leading to a state of psychosis. Lack of sleep can also lead to sleep paralysis. If the victims excessively worried about *maleficium*, they could have developed mental illness leading to extreme hallucination and other maladies.

Satanism and Women

To demonstrate the awesome power of Mary Ingleman, Fairfield's John Eric, a magician and *au fait* demonic conjurer, publicly summoned the devil and trapped him in a chimney. According to accounts, Eric "slipped his hand in his pocket, took out a quantity of asafetida [and] threw it into the edge of the fire" (Pearson n.d., 15). A rancid odor permeated the room, and Eric cried out, "the Devil [has] come, don't you smell him. He always comes with a dreadful odor. Run out and you will all see him go up the chimney" (Pearson n.d., 15–16).

The devil was (and still is) a dominant force within Christian society. Most early Americans did not have scientific explanations for misfortune, particularly in remote communities such as Fairfield County. Either one has fallen out of favor with God or has been bewitched by demonic forces. Women were assumed to be disproportionately predisposed to the wiles of Satan.

After all, it was Eve who surrendered to the temptations of the serpent and is, therefore, responsible for mankind's original sin. The medieval *Canon Episcopi* provides a good example of how the Church views women and their vulnerably to evil temptations. According to the *Episcopi*, women who claimed to fly at night with the goddess Holda were instead sufferers of demonic chicanery (Bever 2012, 69). The medieval Church viewed paganism as akin to devil worship, with women being the likely victims.

According to sixteenth-century German pastors Wilhelm Bidembach and Matthäus Alber, "If one wanted to burn all such malevolent women, one would not have enough wood and fire" (qtd. in Bever 2012, 70). Unfortunately, this statement is strikingly accurate. Throughout the sixteenth and seventeenth centuries, close to 60,000 people were executed for witchcraft. Of this number, women made up at least 75–85 percent of those executed (McKay and Wiesner-Hanks 2017, 420).

It appears American witch panics were no different. Thirteen of the nineteen hangings in Salem were of women. Of the eleven witch hangings in Connecticut in the mid-seventeenth century, nine were women. Following this trend, it's not surprising that two of three witches in Fairfield County were women.

Even as we approach the late twentieth and early twenty-first centuries, women are still vulnerable to claims of demonic activity. Pop culture loves to portray young women as vulnerable agents of demonic possession. *The Exorcist*, *The Last Exorcism*, *The Exorcism of Emily Rose*, *The Devil Inside*, *The Possession*, and *The Conjuring* films all display women (or pubescent girls) as susceptible to the temptations of the devil (Gaudette 2017). *The Exorcism of Emily Rose* was based on a true but botched exorcism involving a young girl named Anneliese Michel. *The Conjuring* (both I and II) are based on the "true" stories of paranormal investigators Ed and Lorraine Warren; both movies involve females. *The Entity* was also based on the "true" story of Doris Bither. Rather than being possessed, Bither was repeatedly raped by invisible apparitions (see Benjamin Radford's article in this issue).

Western culture and superstition ascribe women as vulnerable and damaged. As nineteenth-century French historian Jules Michelet wrote, "Fifteen or twenty days of twenty-eight … a woman is not only invalid but a wounded one. She ceaselessly suffers from love's eternal wound" (qtd. in Cole and Symes 2014, 646). Historically, it appears women are biologically predisposed to the tricks of Satan because they are "wounded" and do not possess the mental and physical fortitude to withstand the aggressive temptations of the devil.

Chief witness Isaac Collins felt the wrath of Ingleman's Satanic powers. While hunting at "McTyre's old field," he noticed a sizeable deer and attempted to fire his rifle. His

weapon would not discharge. Finally, after he inserted a "sliver of silver," he successfully unloaded his rifle. The deer suddenly morphed into an injured black cat and consequently tottered away. Later, while working in a cornfield, an injured Mary Ingleman approached Isaac Collins. With her arm in a sling, she said to Collins, "This is your work." According to Collins, Ingleman "was the deer, the black cat, and again herself" (Pearson n.d., 9–11).

Collins further testified that "Mary Ingleman turned him into a horse and rode him to a great witch convention" (Pearson n.d., 10). As they galloped to the assembly of witches, the devil approached and said, "Mother Ingleman, you have a splendid horse" (Pearson n.d., 11). Ingleman replied, "This is that rascal Collins" (Pearson n.d., 11).

Women are "prey" to the predatory instincts of the devil. Because women are subservient in our Christian patriarchy, the only way they can challenge male domination is to invoke the supernatural powers of Satan. Isaac Collins was probably a powerful man in Fairfield County. Normally, his power and wealth would permit him to dominate the socioeconomic aspects of society. However, when faced with failure (such as, perhaps, a fruitless hunt), the only plausible explanation could be supernatural chicanery invoked by a woman such as Mary Ingleman.

Alleged home of Mary Ingleman, one of three residents of Winnsboro, South Carolina, accused of witchcraft in 1792. (Photo courtesy of the Fairfield County Museum.)

Prejudice and Medicine

Perhaps Mary Ingleman was not a witch but rather a victim of intolerance. According to Pearson's account, she was reportedly "of German extraction" and "probably a native of Germany" (Pearson n.d., 17). Pelham Lyles, of the Fairfield County Museum, argues that Ingleman might have practiced the Dunker faith (or the German Baptist Brethren), which—in an overwhelmingly English society—may have subjected her to prejudice and ridicule.

Furthermore, Ingleman could have dabbled with pre-Christian paganism. This was not unheard of in the seventeenth and eighteenth centuries. In 1796, for example, denizens of Beutelsbach, Germany, sacrificed a live bull in an effort to ward off hoof-and-mouth disease (McKay and Wiesner-Hanks 2017, 601). Priests in eighteenth-century France were known to berate parishioners who participated in pagan bonfire ceremonies during Lent, which were intended to ward off illness and augment crop production (McKay and Wiesner-Hanks 2017, 601). If Ingleman experimented with pagan rituals not sanctioned by the church, she might have attracted church leaders looking for reprisal.

In addition, according to Pearson, "Her knowledge of pharmacy was considerable" (Pearson n.d., 17). Late eighteenth-century apothecaries were hardly regulated, especially in rural communities in North America. Ingleman could have been the community herbalist, a skill she acquired while living in Germany. Perhaps these medications were seen as odd, foreign, or occult to some in the community.

Many eighteenth-century medicines were more toxic than beneficial. For instance, many medicines contained mercury and arsenic. Hemlock and deadly nightshade were commonly used in certain medicinal elixirs (Morris n.d.). Ingelman may have accidentally given a deadly concoction of herbs and poisons to an ailing individual, sparking accusations of witchcraft.

The Witch Trial

Did the devil and his witches plague rural South Carolina in 1792, causing possession, levitation, and animal mutilation? Many eighteenth-century citizens of Fairfield County certainly thought supernatural forces were at play. At Thomas Hill's Barn, approximately five miles from the county courthouse, arguments were made against the accused. In the end, the evidence against the three witches was sufficient, and Mary Ingleman, Hending Smith, and Sally Smith were found guilty of witchcraft. According to one account, all three victims were subsequently whipped "in the most shocking manner." Then "hot coals were applied to their extremities, till [*sic*] signs of life were scarcely discernable" ("Paris; Boston …" 1792, 3–4).

Regardless of what transpired in the fall of 1792, it's important to properly analyze the strange occurrences in Fairfield County. According to a 2019 survey, close to 45 percent of Americans still believe in ghosts and demons (Scott 2019). Even prominent doctors and psychiatrists are among this confounding statistic. Stella Immanuel, one of America's so-called "Frontline Doctors," a small group that embraces a range of conspiracy theories, once claimed uterine disorder endometriosis was caused by intercourse with demons while sleeping (Andrews and Paquette 2020). Ivy League–trained psychiatrist Richard Gallagher claims demonic possession exists, and he acts as a "consultant" on cases of possession (Blake 2017). Even Dr. Jeffrey Lieberman, the former chair of Columbia's psychiatry department, has entertained demonic possession.

Throughout his tenure as an expert psychiatrist, Lieberman has seen cases that "could not be explained in terms of normal human physiology or natural laws" (Mariani 2018).

Although we are not burning innocent victims, witch panics still occur in modern America. The Satanic panic of the 1980s and *Miller v. Davis* are prime examples of supernatural-inspired moral panics. The Vatican still offers courses on exorcisms, as demonic possession appears to be on the rise. For a mere $370, Christians can learn the trade of casting out the devil from expert priests in Rome ("Exorcism" 2018). Jerry Falwell even blamed homosexuals, abortion activists, and the ACLU for the September 11 terrorist attacks.

Critical thinking and skepticism are core elements of historical analysis and science. As a society, we need to properly analyze historical claims of the paranormal in an effort to combat modern theologically induced moral panics. Only by revisiting historical assertions of the paranormal can we begin to reshape and debunk contemporary accusations of the supernatural, especially those endorsed by "expert" psychiatrists and medical doctors. Let us not forget: when so-called doyens of medicine invoke the paranormal rather than empirical evidence, patients go undiagnosed and continue to suffer. ■

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Date of filing: September 17, 2021. Title: Skeptical Inquirer. Frequency of issue: Bimonthly. Complete mailing address of known office of publication: 3965 Rensch Rd., Amherst, Erie County, NY 14228-2713; P.O. Box 703, Amherst, Erie County, NY 14226-0703. Publisher: CFI (Center for Inquiry), Inc., 3965 Rensch Rd., Amherst, Erie County, NY 14228-2713; P.O. Box 703, Amherst, Erie County, NY 14226-0703. Editor: Kendrick Frazier, 944 Deer Dr. NE, Albuquerque, NM 87122-1339. Managing Editor: Julia Lavarnway, P.O. Box 703, Amherst, NY 14226-0703. Owner: CFI (Center for Inquiry), Inc., 3965 Rensch Rd., Amherst, Erie County, NY 14228-2713; P.O. Box 703, Amherst, Erie County, NY 14226-0703. Known bondholders, mortgagees, and other security holders: None. Average number of copies of each issue during the preceding 12 months: (a) Total number of copies (net press run) 24,708. (b) Paid and/or requested circulation: (1) Paid/requested outside-county mail subscriptions stated on form 3541: 17,053. (2) Paid in-county subscriptions stated on form 3541: 0. (3) Sales through dealers and carriers, street vendors, counter sales, and other non-USPS paid distribution: 3,106. (4) Other classes mailed through the USPS: 0. (c) Total paid and/or requested circulation (sum of b[1], [2], [3], [4]): 20,159. (d) Free distribution by mail (samples, complimentary, and other free): (1) Outside-county as stated on form 3541: 178. (2) In-county as stated on form 3541: 0. (3) Other classes mailed through the USPS: 160. (4) Free distribution outside the mail (by carriers or other means): 148. (e) Total free distribution (sum of d) 486. (f) Total distribution (sum of c and e) 20,645. (g) Copies not distributed: 4,063. (h) Total (sum of f and g): 24,708. Percent paid and/or requested circulation (c divided by f times 100): 97.6%. Average number of electronic copies of each issue during the preceding 12 months: (a) Paid electronic copies: 1,808. (b) Total paid print copies (line 15C) + paid electronic copies: 21,967. (c) Total print distribution (line 15F) + paid electronic copies: 22,453. (d) Percent paid (both print and electronic copies): 97.8%. Number of copies of the single issue published nearest to filing date: (a) Total number of copies (net press run) 25,312. (b) Paid and/or requested circulation: (1) Paid/requested outside-county mail subscriptions stated on form 3541: 17,467. (2) Paid in-county subscriptions stated on form 3541: 0. (3) Sales through dealers and carriers, street vendors, counter sales, and other non-USPS paid distribution: 4,135. (4) Other classes mailed through the USPS: 0. (c) Total paid and/or requested circulation (sum of b[1], [2], [3], [4]): 21,602. (d) Free distribution by mail (samples, complimentary, and other free): (1) Outside-county as stated on form 3541: 178. (2) In-county as stated on form 3541: 0. (3) Other classes mailed through the USPS: 160. (4) Free distribution outside the mail (by carriers or other means): 148. (e) Total free distribution (sum of d) 486. (f) Total distribution (sum of c and e) 22,088. (g) Copies not distributed: 3,224. (h) Total (sum of f and g): 25,312. Percent paid and/or requested circulation (c divided by f times 100): 97.8%. Number of electronic copies of the single issue published nearest to filing date: (a) Paid electronic copies: 1,881. (b) Total paid print copies (line 15C) + paid electronic copies: 23,483. (c) Total print distribution (line 15F) + paid electronic copies: 23,969. (d) Percent paid (both print and electronic copies): 98%.

The Psychology of U.S. Vaccination Hesitancy

COVID-19 vaccine refusal, which results in high mortality rates, ranges from "relatively reasonable" to "somewhat irrational" to "quite irrational." People in each category have different psychological reasons for their beliefs. Education efforts should focus on those in the first two and not waste scarce resources on the third.

PETER BARGLOW, MD

Vaccination confers almost total protection to all adults fully vaccinated against the COVID-19 virus. Because over 650,000 persons have died in the United States alone from this pandemic, it becomes vital to fully understand the phenomenon of vaccine refusal. Recent news sources reported that COVID-19 cases are rising in almost every state, resulting in increasing hospitalizations and deaths ("Coronavirus in the US" 2021). The best explanation for this increase is large-scale failure to vaccinate combined with the rapid spread of the highly contagious Delta virus variant.

As of the latest CDC figures on August 21, 2021, only about 51 percent of American adults have received vaccination against the new virus. This statistic is astonishing, because vaccination has been scientifically proven to be effective and safe. Ninety-nine percent of recent American COVID-19 deaths were of unvaccinated persons.

"Vaccination is the number 1 most effective mitigation step to protect families and neighbors," commented Dr. Sam Page on July 7 about high infection rates in Missouri (Page 2021). Dr. Rochelle Walensky, director of the National Centers for Disease Control and Prevention, said the United States was experiencing "a pandemic of the unvaccinated" (Anthes and Petri 2021). Though it has become clear that even those fully vaccinated can still catch the virus, very few become seriously or fatally ill.

It is a serious mistake to lump men and women who choose not to have vaccine protection into one single category, though news reports often do this. I maintain that American adults who choose not to receive COVID-19 vaccination are quite diverse. Hispanics and African Americans, who are vaccinated at lower rates than whites, in particular may have special reasons, such as poor access to medical care and distrust of the medical establishment. My emphasis here is not on political party or religious affiliation; it is instead focused on psychological reasons.

Cultural majority populations are better understood and

have clearer reasons for their reluctance to be vaccinated. I confine my psychological investigation to them. I arbitrarily divide these into three groups: 1. the relatively reasonable hesitant; 2. the somewhat irrational refusers; and 3. the quite irrational avoiders.

Many explanations have been offered for people's refusal to be vaccinated against COVID-19. But to this doctor author, most of them seem incomplete or unconvincing. A skeptic must regard many current political analyses as superficial and shallow. Before reexamining the most popular reasons provided for vaccine hesitancy, I will offer a summary of vaccination history overall, apart from COVID-19 specifically.

Without doubt, immunization can boast proven worldwide value. It may even be the most spectacular single achievement in public health. But in the United States, anti-vaccination sentiments arose as rapidly as vaccination itself. The first American vaccination against smallpox was criticized as antithetical to God's will. One enraged citizen bombed the house of pro-vaccination New England Puritan minister Cotton Mather in 1721 (Ault 2021).

Variolation, later known as inoculation, had come to Britain during the early eighteenth century. It immunized persons against smallpox by infecting them with material obtained from skin pustules produced by a mild form of the disease, *variola minor*. When smallpox later occurred, it was less virulent. The technique had many risks, including death. The Chinese had used the method as early as the year 1000. In the late eighteenth century, Emperor K'ang, who survived smallpox, had his children inoculated in this way. In fact, this method may have originated as early as 200 BCE.

During the eighteenth century, 400,000 Europeans died of smallpox per year. A son of Benjamin Franklin died from it in 1736. Edward Jenner in England had the idea of taking fluid from a cowpox blister and placing it in scratches he made on the skin of a child in 1796. The boy had a brief illness, but when he was later exposed to smallpox, he did not become sick. But Jenner's inoculation at the time incited opposition based on infection risks, use of animals to cure humans, and doctors profiteering from the discovery. Much later (1958–1977), vaccination with a live vaccinia virus replaced inoculation. Finally, smallpox was almost eliminated from the world. Other live vaccines were developed that protected humans against diphtheria, whooping cough, measles, mumps, rubella, and chickenpox. Spread of polio, pneumo- and meningococcus, hepatitis B, and type B influenza were prevented through these methods.

The COVID-19 vaccines Moderna, Pfizer, and Johnson & Johnson were manufactured during 2020–2021 with unique speed. "Viral vectors" ingredients used a novel fabrication process. The Federal Drug Administration (FDA) gave the vaccines emergency authorization, and they were put into widespread use. In August 2021, the FDA gave full authorization to the Pfizer vaccine, which many cautious persons require to feel safe getting it. (FDA approval of Moderna is expected also.) The FDA is not an infallible arbiter of a drug's efficacy, and sometimes the agency succumbs to public advocacy or big manufacturing company pressures in their approval process. But its approval is the best proof of scientific veracity that we have. So what motivates vaccine hesitancy in American majority populations? Even former President Donald Trump was finally vaccinated. I first consider the views of the many typical Americans who fear little harm from COVID-19 but much harm from vaccines.

The 'Relatively Reasonable Hesitant'

An example of a healthy woman who steadfastly has refused to be vaccinated will introduce a few major questions about such reluctance.

Case History #1

Martha is a forty-year-old upper-middle-class college graduate. A teacher who lives in the suburbs, she claims she will not be vaccinated. This is unusual, because American women are more likely by 3:2 odds to choose to be vaccinated than are males, and in American families, health concerns tend to be often assumed by women (possibly accounting for females' longer life expectancy). Martha has been happily married for ten years to a wealthy business executive who did get the vaccine. The couple has chosen to remain childfree, because they love the freedom to travel and fully enjoy art, music, and culture. (Women without children are slightly less likely to be vaccinated than those with offspring.)

Martha is rather thin and profoundly preoccupied with health. She exercises daily and consumes a natural food diet emphasizing homegrown vegetables and fruits, which help maintain her stable weight. About vaccination, she says, "I don't want any artificially manufactured, chemical substance put into my body." Also, she has heard that current vaccines have not yet received full governmental approval, which worries her. She feels safe from the COVID-19 virus anyway, because she usually wears a mask in public, sometimes even with casual friends. She observes distancing precautions and avoids crowds. She endorsed the following adjectives on a scale of concerns about the vaccine: *impure*, *unnatural*, *unhealthy*, *unclean*, and *unknown*.

Martha is influenced by the many prominent people frequently appearing in national news media who emphasize the dangers of vaccination. It seems likely that most such reporting has some integrity and is based on some evidence. (An exception with pre-COVID-19 vaccine reports was the 1998 fake case series of Andrew Wakefield and colleagues, who fraudulently associated the MMR vaccine with autism in children [Sathyanarayana and Andrade 2011].) Fox News' pundits Tucker Carlson and Laura Ingraham, each with millions of viewers, have overemphasized the dangerousness of vaccines and claimed governmental overstep in pushing them. The Biden administration vaccination initiative, Carlson claimed, was a scandal and an attempt to "force people to take medicine they don't want or need" (Hsu 2021). Why are many susceptible to this view?

Carlson is influenced by right-wing extremists politically. He overemphasizes the dangers of vaccination and its side

effects. Robert F. Kennedy Jr., an environmental lawyer with the Kennedy name, is very influential and responsible for half of the anti-vaccine advertising content on Facebook. He was influenced by Andrew Wakefield and has particularly emphasized the medical dangers of vaccination to blacks and Hispanics. Rudolf Steiner, founder of Waldorf Schools, advocated for "anthroposophy," which postulates a spirit world accessible through clairvoyant insight. Vaccination for him represents "secular civilization's impoverished substitute for spiritual enlightenment" (R. Barglow and Schaefer 2021).

All of us—no matter how expert or specialized—are influenced by the personal experiences of peers, friends, and others who are similar to us or whom we admire. This author became quite worried about COVID-19 vaccination when it was reported that Gregory Michael, a healthy Miami middle-aged obstetrician, died sixteen days after being vaccinated (Grady and Mazzei 2021). However, a follow-up report—not well publicized—concluded that he had died from a medical disorder unrelated to his vaccination. All of us are persuaded by publicized beliefs of national leaders with impressive credentials. But people in my first category, such as Martha, frequently can be persuaded to change their vaccination stance with more information.

The 'Somewhat Irrational Refusers'

Medical complications of COVID-19 vaccination are extremely rare; even so, worry about these to the extent of refusing the vaccine is a common rationale. To illustrate, I offer a case history of a man who for many months had refused vaccination. He eventually changed his stance, giving in to the dual pressure from me (his therapist) and from his wife, a scientist. The example also introduces the important potential magical meaning of syringe needles in investigating vaccination hesitancy.

Case History #2

Eighty-year-old Samuel is a married retired accountant originally from Brazil. He sought psychiatric treatment for anxiety and PTSD symptoms, psychological depression, and bouts of paralyzing anxiety. He also suffered from physical symptoms secondary to trigeminal neuralgia, gastro-paresis with a variety of chronic bowel symptoms, chronic fatigue syndrome, right-hand tremor, and difficulty with walking long distances. He has never suffered from alcohol- or drug-abuse problems. Recently he has been prescribed low-dose Propanolol, Gabapentin, Buspirone, Hydroxyzine, Lyrica, Amphetamine salts, and Oxycodone tablets.

His many physical and psychiatric conditions had made it impossible to maintain his lifelong success as a skilled accountant. He reluctantly received doses of the Pfizer vaccine after extensively researching its benefits and risks. Right away he developed a slight rash at the injection site, small temperature fluctuations, and a worsening of his arm tremor. Two days after the second injection, he could no longer walk and became confined to a wheelchair. He attributed all this to his COVID-19 vaccination.

Reading this case history could convince many cautious, clear-thinking Americans that vaccines indeed have unknown dangers. But serious adverse medical post-vaccination events occur in only about 0.6 percent of patients (compared with 0.5 percent in a placebo group) (Federal Drug Administration 2021). But such extreme concerns about possible vaccine complications account for many instances of vaccine refusal. "What will happen two or three years from now if I'm vaccinated today?" is a frequent worry. But Americans who worry about such long-term effects can sometimes change their minds when presented with contrary evidence.

It did appear that my patient's ambulation impairment was worsened by the vaccination, but a clear cause-effect explanation could not be determined. The patient and I agreed to continue routine psychological and medication management of his multiple conditions. He agreed to set aside further consideration of the impact of his vaccination. Physical therapy was reinstituted. The "full approval" by the FDA for the Pfizer vaccine (on August 23, 2021), and the absence of severe side effects in the many millions of people who did get vaccinated, can and sometimes does change people's minds, given enough support and reassurance.

The 'Quite Irrational Avoiders'

Magical beliefs about needles and/or fluids can often be identified in the third category of vaccination refusers. Americans, mostly males, who have strong views against vaccination in general constitute a far smaller group than do the first two categories. To further consider the meaning of needles, I will return to Case History #2 above.

In his past, the psychiatric patient, Samuel, had a major worry about complications from vaccination, and he did suffer a minor side effect from the injection. But he had previously regularly used acupuncture for help with his medical symptoms. The ostensibly ancient aspect of this treatment, to him, demonstrated the potency of needles. Treatments that have a mysterious power to heal also may be associated with the power to harm. In traditional Chinese medicine, acupuncture has for many centuries "cured" physical symptoms. I maintain that this is a consequence of the placebo power of needles inserted below the skin's surface. No investigator has as yet located any evidence for the presence of the twelve Tai Ming meridians, which acupuncturists claim will produce benefits when punctured. But both needles and their contents can have much emotional power to influence decisions, more than rational realistic concerns have. (More discussion about needles will follow below.) This patient did not suffer from "fear of needles," but many persons do.

A different and far more dangerous and irrational opposition to vaccination characterizes the vocal groups of so-called "conspiracy theorists." One national March 2021 investigation showed that 16 percent of eligible Americans refused vaccination for two reasons: skepticism about the reality of the pandemic and a belief in at least one conspiracy theory (Smarsh 2021). Only a part of this resistance relates to "trypanophobia"—an irrational needle fear or "aichmophobia," a fear of sharp objects.

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Conspiracy thinking typically involves ideas about invisible, secret, mysterious agents introduced into the healthy body. These refusers' focus is on "unnatural" hidden chemicals in new vaccines that could cause changes in DNA, among other things. Probably, this category of vaccine resister must be considered to be discontinuous with the "somewhat irrational" opposition to vaccination group discussed just above. The 50,000 members of the QAnon movement are the most influential representatives of this category. Their possible psychology serves as the focus for understanding this third category of vaccination resister.

Here the central thesis of QAnon regarding coronavirus vaccines is that they are not targeted toward saving lives but are "bioweapons concocted by an evil secret cabal of corrupt government officials and drug companies" (Timberg and Dwoskin 2021). The supposed leaders of this loose organization also believe Democrats, some celebrities, and evil others have dark hidden goals and practices, including the promotion of child sex trafficking and even the eating of babies.

Who is the typical QAnon believer? Members are predominately middle-class white males who share a devotion to video games, cryptocurrency, and men's rights. Women such as Marjorie Taylor Greene, who stated a concern for child

protection, reflect a minority of conspiracy believers. There is some overlap with right-wing doubt of Big Government, as was shown in the large Conservative Political Action Conference in Texas July 9–11, 2021. Their misogynistic concerns adopt many of former President Trump's wilder but influential comments, such as the following one made to former Vice President Mike Pence: "You can either go down in history as a patriot or you go down as a pussy" (Chait 2021).

Such a hyper-masculine stance valorizes matter that is hard and solid (male) over substances soft and fluid (female). A kind of phallic pride is involved. The "swampy" and unsolid are to be feared. Not surprisingly, such concerns on the part of men are not new. Study of German history recalls the fears of the German Freikorps soldiers a century ago. In 1914 after World War I, they were preoccupied and hostile to the human body's slimy substances (Theweleit 1987).

These concerns reached their greatest influence a few years later during the 1918 flu epidemic, just after the war. Then, as today, airborne infections carried menace. Fans of old movies will be reminded of the character General Jack Ripper in the 1964 Stanley Kubrick film *Dr. Strangelove*. This heroic fictional character launched a nuclear strike on the Soviets to defend the purity of "our precious bodily fluids."

Can some QAnon members be considered paranoid? They have unfounded fears that they are being or will be persecuted. They are mistrustful, suspicious, and slightly grandiose. Among their concerns is that new vaccines will change their genes by being inserted into their DNA. One variation of this imagined danger is that mind-controlling microchips are inserted through the vaccine for the purpose of total government control.

Such a danger for conspiracy believers seems far more frightening and threatening than the disease itself. The radio show host Alex Jones has websites widely disseminating these views (Homans 2019). To understand such widely disseminated views requires a nonpolitical "depth" psychological examination.

It is useful to empathize with the lived experiences of an ordinary person receiving an injection. The vaccine fluid is fully visible to the patient while confined to the plastic or glass vial. The needle transfers the liquid beneath the patient's skin into the muscle, where it can no longer be seen and becomes invisible to the naked eye. That which can't be seen concretely, for some emotionally vulnerable people, may be easily conceptualized as secret, toxic, impure, unsafe, and dangerous. The process can seem emotionally dangerous, particularly to males. As mentioned earlier, males statistically avoid vaccines more than females.

My understanding uses a conception of developmental visual psychology I described half a century ago (P. Barglow and Sadow 1961). What the year-old baby sees, early in life, becomes a way to decide between what is real and likely permanent or unreal and fleeting. Later what is seen allows the older now adult person to decide what is true and what is false. Sight continues to guarantee reality during adulthood. What can't be seen (viruses or vaccine contents) can seem unreal. And the "soft" liquid substance injected into the arm seems menacing.

Those whose lives habitually are dominated by conspiracy theories are unlikely to change their opposition to vaccination. It is a waste of scarce educational and information resources to try to educate them. National efforts should focus upon only the "relatively reasonable hesitant" and the "somewhat irrational refusers" who might utilize this life-preserving and readily available medical procedure if given enough information and reassurance. A person just needs to be convinced to say "yes" to vaccination once or twice. ■

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Peter Barglow, MD, has published over one hundred medical and psychiatric articles. He once was a Residency Training Director, Inpatient Psychiatry Unit Leader, and Chief of Addiction Medicine. He has been a professor of psychiatry at UC Davis and Northwestern Medical Schools.

A Design for a Definitive Experiment to Test Homeopathy

Homeopathy is quackery in a class of its own. It can't really work, but what would evidence that it does work even look like? Here's a proposed controlled test.

RICHARD DAWKINS

You may bend over backward to defend your pet "alternative" remedy—herbal medicines, acupuncture, Chinese traditional medicine, tribal witchdoctor cures—whatever it is. If the evidence supports it, your pet remedy deserves to be embraced by orthodox medicine. But homeopathy is in a class of its own. Not only does it not work, but—with a reservation to be entered below—it *cannot* work. Or, putting it at its mildest, if homeopathy is your personal favorite quackery, you are going to have to bend over backward a massive lot further than for any other branch of alternative medicine.

Homeopaths believe effectiveness increases the more you dilute the putatively active ingredient. They measure dilution on a logarithmic so-called C-scale. 30C—which is recommended as a good, effective dose—corresponds to a dilution of one part in 10^{-60}. The late James Randi calculated that this is equivalent to one molecule of the active ingredient in a volume of water equal to the volume of the solar system. In other words, there is no active ingredient at all.

Critics often say there is no good evidence that homeopathy works. But that misses the point. What would such evidence look like? What *could* it look like? There'd have to be a double-blind control trial in which patients were treated either with the homeopathic dose or with a control substance, say water. Because both the experimental and control doses are identical—water—the experiment cannot yield a positive result. With the reservation mentioned, it follows that there can be no evidence in favor of homeopathy.

Actually, neither the experimental nor the control dose is pure water anyway. At the levels of dilution we are talking about, both doses contain traces not only of the allegedly active ingredient but of everything else as well—including Oliver Cromwell's urine. Such conclusions follow from the following familiar calculation (I'm not sure who first made it, but I got it from Lewis Wolpert's *The Unnatural Nature of Science*): There are many more molecules in a glassful of water

than there are glassfuls of water in the world, including the sea. The same applies to bladders. So every time you have a cup of coffee, you are probably imbibing a component of the urine of Cromwell (or it was once sucked into the trunk of the last mastodon, or circulated in the blood of Christ, etc.).

I said there is a reservation. Homeopaths have a get-out, or they think they have. Water is endowed with "memory." When homeopaths prepare a medicine, they don't just dilute it multiple times. It is subject to *succussion*—shaking in a special, ritualized way. Succussion takes place at every one of the stages of dilution. The molecular shape of the active ingredient somehow imprints itself on the water and is replicated, via succussion, in all the water of subsequent dilutions. Nobody knows what the actual mechanism of water memory is. If it exists, it is something entirely unknown to science. That is not impossible. The homeopath who demonstrated it would win not only the Nobel Prize for Medicine but the Nobel Prize for Physics as well. You'd think that with such dazzling incentives, they'd all be beavering away trying to demonstrate, once and for all, the memory in water. Instead, all they do is tell anecdotes about patients who recovered—as they probably would have anyway.

You don't even have to do the physics. A purely medical trial would suffice to demonstrate, to any desired level of statistical confidence, that homeopathy really works. It's not difficult to set up the necessary experiment. Here is my design.

Take a number N (the larger the better) of patients suffering from a complaint that homeopaths agree is suitable to be cured by some particular potion when it is diluted to the 30C level. If possible, match the patients in pairs: same sex, roughly similar age, etc. Matching pairs are not essential, but they increase the chance of a positive result. One of each pair will receive the control dose, the other the homeopathic, determined at random. Of course, the patients mustn't know which dose they receive, nor should any doctors, homeopaths, nurses, or indeed anyone else who comes in contact with the patients. The knowledge is locked away in the form of secret numerical codes to which nobody has access until the experiment comes to its predetermined end.

So much is standard double-blind procedure. I happen to have chosen a matched pairs design, but other designs would work fine as well. Now, however, for the special concession to homeopathic succussion theory. It is laborious but necessary. Every patient must have their own fully succussed dose. The control water must be succussed in exactly the same way as the homeopathic water. The only difference is the small quantity of substance—or water—that is added at the start of the procedure. Why must every patient have their own separately succussed dose? Why not prepare a large vat of homeopathically succussed water that you dip into for half the patients and another large vat of control succussed water that you dip into for the other half of the patients? Because there might be a difference between the vats, their temperature, how close they are to the window, perhaps an insect fell in one of them, perhaps the succussion was slightly different; it doesn't matter what. If the succussion procedure is undertaken separately for each individual patient, there is no possibility of such confounding error.

The succussion itself may be done by professional homeopaths, and they can be as biased as you like—they have no way of knowing whether they are succussing control or homeopathic water. The judgment as to whether each patient's health has improved can also be done by professional homeopaths or by conventional doctors, any of whom can be biased. It doesn't matter who does it, or what their biases might be, so long as neither they nor anybody else knows which dose was which. Nobody must know until the codes are broken and the experiment ended. The statistical analysis will then reveal whether the homeopathic treatment worked.

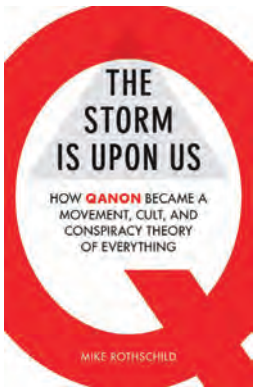
This experiment has not been done. Other experiments have taken place, but none of them, as far as I know, have taken the crucial step of succussing control water as well as homeopathic water separately for each patient. If this experiment is properly done and yields a positive result, I'll eat my hat—but not before raising it to homeopathy. ■

The Center for Inquiry is suing retailers who display homeopathic remedies alongside evidence-based medications.

Richard Dawkins's latest book is *Books Do Furnish a Life: Reading and Writing Science*. The evolutionary biologist and bestselling author of *The Selfish Gene*, *Unweaving the Rainbow*, *The Magic of Reality*, *Science in the Soul*, and many other books is a fellow of both the Royal Society and the Royal Society of Literature and remains a fellow of New College, Oxford. He is also a fellow of the Committee for Skeptical Inquiry.

The Storm of Weird and Dangerous Beliefs

STEPHANIE KEMMERER



The Storm Is Upon Us: How QAnon Became a Movement, Cult, and Conspiracy Theory of Everything. By Mike Rothschild. New York, NY: Melville House, 2021. ISBN 9781612199290. 320 pp. Hardcover, $28.99.

Once when asked about her name, Madonna replied, "I sometimes think I was born to live up to my name." Although the life of a pop star and an investigative journalist are worlds apart, there are few who fit this quote as well as Mike Rothschild.

In the conspiracy community, no surname is as detested as much as Rothschild—except for Soros. There is a delicate irony that he documents conspiracies and finds himself being accused of being part of them simply because of his last name.

There's also bravery. While he is not related to the Rothschilds of conspiracy infamy, his Twitter feed is often flooded with angry accusations from people who insist he is. So it seems rather fitting that Rothschild specializes in researching and writing about conspiracy culture and extremism.

Rothschild has been researching and writing about QAnon since January 2018—only a few months after Q Clearance Patriot first posted on 4Chan. He has been screaming into the void for quite some time, watching the ever-changing narrative evolve and devolve.

The Storm Is Upon Us is an important record of this narrative from the very beginning to the current state of disarray. Even though I am a QAnon researcher myself, I admit there were things I did not know about until I read this book, such as the Grass Valley Charter School (GVCS) incident. Located in California, GVCS became the target of wild QAnon conspiracies back in April 2019, when an innocent Tweet by former FBI Director James Comey was decoded, or "baked," by QAnon followers.

On April 27, 2019, the hashtag #FiveJobsIveHad was trending, and Comey listed five previous jobs. QAnon followers saw it as a threat, because the first letter of each job listed spelled out GVCSF and the hashtag itself was interpreted as "five jihads." Their conclusion was that Comey was planning an attack on Grass Valley Charter School. As for the F, they assumed this stood for "festival," which the school was holding in May. The Blue Marble Jubilee festival had to be canceled—not because of any legitimate threat but because there was concern that the people reporting this "threat" might show up as vigilante guards.

The GVCS incident illustrates just one of the many threats that the QAnon movement poses, but it doesn't end there. A whole chapter, "This Is Not a Game: The Many Crimes of QAnon Followers," details the absurd, dangerous, and deluded actions that have become inseparable from the movement.

Of course, the most notable and disturbing collective QAnon crime was the insurrection attempt at the U.S. Capitol on January 6. This was QAnon's coming-out party. The nation watched in horror as massive violence unfolded on live TV, with many people expressing confusion or shock as this anarchy occurred.

"They shouldn't have been shocked," Rothschild writes, referring to the mainstream media's reaction to the insurrection. In that one sentence, Rothschild expresses the sentiment that many QAnon researchers felt on that dark day: January 6 was a Cassandra moment; countless QAnon researchers had been warning about such events for years, but no one was listening.

Throughout the book, the pain and confusion of QAnon becomes more and more clear, nowhere more so than in the last chapter, which is perhaps the most difficult to read. "Where We Go One: How to Help People Who Want to Get Out of Q" describes the micro effects that QAnon has had on families. Lives and relationships have been torn apart by this conspiracy theory that has no evidence to back up any of its claims.

But there is an upside to this:

> Most QAnon believers won't go down the road that ends at the wrong side of a Capitol police officer's gun. For all of the crimes and violent ideation we've seen, many believers truly want to play a role in making the world a better place. That they've chosen to do it through QAnon is a problem, of course. But it's not a problem that lacks a solution. And some Q believers do find that solution,

eventually coming to it on their own with encouragement from people on the outside that they trust.

Rothschild recounts the victorious stories of those who escaped the rabbit hole and how their reemergence has made them happier and more productive. Of course, no collection of recovery stories would be complete without mentioning Jitarth Jadeja (whom I interviewed for my article, "Life, the Quniverse, and Everything, Part 1," in the March/April 2021 Skeptical Inquirer). Jadeja has emerged as one of the most vocal opponents of QAnon after his recovery. His story stands out because he actively works to help and support those who are themselves recovering or currently dealing with family members still lost.

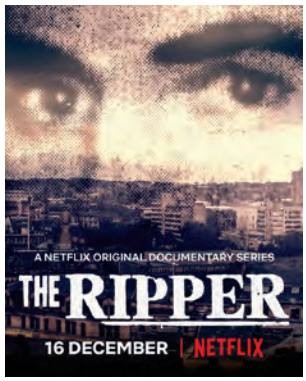
The Storm Is Upon Us presents the entire history of QAnon clearly and concisely. Even a casual reader not well versed in the ins and outs of QAnon can understand all the issues easily, aided by a glossary of QAnon terms.

No conspiracy movement has become as widespread and dangerous as QAnon. There are elected officials who are true believers, and their rhetoric has led to futile election audits nearly seven months after Joe Biden took office. This is an important book about an important topic. The more we educate ourselves about this threat, the less likely we are to have another January 6. It's also of the utmost importance that we understand it could happen again—but hopefully the next time Cassandra's cries will be heard. ■

Stephanie Kemmerer is a freelance writer who focuses on QAnon and other conspiracy movements. She wrote the two-part series on QAnon, "Life, the Quniverse, and Everything" and "QMan Trafficking and the 'Plandemic'" in our March/April and May/June 2021 issues. She is a researcher and writer for *Even the Podcast Is Afraid*.

Tragedy in West Yorkshire

Len Geller



The Ripper, A Netflix True Crime Docuseries. Directed by Jesse Vile and Ellena Wood. Premiered December 16, 2020.

True crime shows are not for everyone, but if you are a fan of the genre and a student of critical thinking, this docuseries is for you. It is dark, gritty, loaded with unexpected turns and twists, and is a fascinating historical window into British society in the 1970s. In focusing on one of the most notorious cases in the annals of British crime, *The Ripper* tries to answer the central question of why the largest and most expensive manhunt in British criminal history failed to catch a brutal and sadistic serial killer known as the Yorkshire Ripper. The Ripper murdered thirteen women and attempted to murder seven others between 1975 and 1981.

The docuseries is a chronicle of bureaucratic obstacles and police missteps that doomed the investigation to failure, and even though the killer, Peter William Sutcliffe, was finally caught, it was purely by accident when he was arrested for an unrelated traffic violation by a local cop who happened to notice a strong resemblance between Sutcliffe and a photofit on the wall of the police station. In the end, thousands of hours of police work involving hundreds of investigators and costing millions of pounds had come up empty. The question is why.

Instead of trying to manipulate viewer emotions through a dramatic reenactment of events or pandering to our morbid fascination with dead bodies by showing grisly crime scenes, *The Ripper* tries to present the facts and get at the truth through interviews with those involved in the investigation and members of the press and public. There is no narrator to manipulate viewer opinion but only the actual words and opinions of the police, forensic experts, the press and public, and, most important, the surviving victims and the families of the murdered victims. To be sure, no documentary is wholly objective, and that is certainly true of *The Ripper*. In the last two episodes, a strong feminist point of view does emerge, but it only partially explains the mistakes in critical thinking that doomed the investigation to failure.

The Ripper is a cautionary tale of the pitfalls to avoid not only in criminal investigation but in any inquiry into the truth. There are at least four of them, and they are on full display in the docuseries. The first is the unwillingness or inability of investigators to critically examine their own biases, in this case a strong sexist and classist bias against women of the lower classes. Throughout the docuseries, we see the dominant sexist and classist attitudes of 1970s Brit-

ish culture reflected in the assumptions guiding the investigation and the media covering it.

The second mistake is allowing wishful thinking to contaminate the search for truth. Wanting desperately to catch the killer to stop the carnage and appease an outraged and fearful public driven by lurid press coverage, the police made assumptions and jumped to conclusions based on fear and hope rather than on the evidence. The third mistake is confirmation bias, the powerful tendency of the human mind to consider only evidence that will confirm one's beliefs and ignore any evidence that will challenge those beliefs. There are many reasons for confirmation bias, but what we see in the Ripper investigation is what is often found in people in positions of power and authority: a self-serving desire to hold on to power coupled with a myopic belief that they know more than their subordinates. This brings us to the final mistake: the dogmatic refusal to admit that one's assumptions and conclusions could be wrong, one of the cardinal sins in criminal investigation. Instead of treating their assumptions and inferences as tentative hypotheses that can be overthrown in the light of new evidence, the leaders of the investigation consistently refused to consider new evidence brought to their attention that would call their beliefs into question.

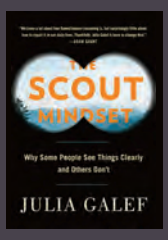
What is shocking about the docuseries is how close the police came to apprehending the killer and preventing many of the murders and attacks, only to have the Ripper slip through their fingers. Over the course of the investigation, Sutcliffe was interviewed nine times by police but still failed to make their top forty suspect list. What makes these events so tragic is that if the critical thinking precepts mentioned above had been in place, even just at key moments in the inquiry, most of the deaths and much of the harm inflicted by Sutcliffe would have been prevented. ■

Len Geller writes on the media and politics, and some of his articles can be found in *The Owl Light News* (www.owllightnews.com). Now retired, he taught philosophy for many years at several colleges and universities in upstate New York.

NEW AND NOTABLE]

Listing does not preclude future review.

THE LEGENDS OF THE PYRAMIDS: Myths and Misconceptions about Ancient Egypt. Jason Colavito. Colavito researches the connections between science, pseudoscience, and speculative fiction. Ancient Egypt is perhaps the oldest and best example. He looks at "the way people imagined (and outright fabricated) Egyptian history from Alexander's conquest in 322 BCE down to the present." He examines how religious belief has bent history to its demands and how race, ethnicity, nationalism, and culture have sought to revise Egyptian history to favor certain groups. And he traces the influence of "a powerful and compelling—but fictitious—idea that the pyramids had a deep and abiding connection" to forbidden knowledge and supernatural creatures. The book is about the power of storytelling and legend-making, which illustrate why, despite the facts, "pop culture sees Egypt as a land of walking mummies, booby-trapped tombs, ancient wisdom, and powerful magic." Red Lightning Books, 2021, 222 pp., $20.00.



THE SCOUT MINDSET: Why Some People See Things Clearly and Others Don't. Julia Galef. In *The Scout Mindset*, Galef, a cofounder of the Center for Applied Rationality and longtime host of the *Rationally Speaking* podcast, examines cognitive errors, tribalism, motivated reasoning, the (underappreciated) role of identity in beliefs, self-deception, and much more. The subtitle might set a few teeth on edge, but as Galef demonstrates, it's a simple fact that some people see things more clearly than others; it's not a matter of intelligence but instead critical thinking. Galef's thesis about the scout versus soldier mindset first came to widespread attention in a 2016 TEDx talk. Applying a military metaphor to critical thinking, Galef compares two functions: a soldier (trained to defend territory/cherished beliefs) and a scout (trained to survey territory/cherished beliefs). While the former role often involves certainty of position and fighting opposing views, the latter is more interested in gaining information and establishing the accuracy of that knowledge. Both are useful in some contexts, but the titular scout mindset is more helpful for gaining useful knowledge. The book is divided into five parts: The Case for the Scout Mindset; Developing Self-Awareness; Thriving Without Illusions; Changing Your Mind; and Rethinking Identity. Each is broken into three chapters, and the individual sections tend to be bite-sized, usually only a page or two long. Galef draws from many disciplines and illustrates her points using a wide variety of anecdotes and examples, from Alfred Dreyfus to Abraham Lincoln, Benjamin Franklin to *Star Trek*. *The Scout Mindset* covers some territory familiar to skeptics, psychologists, and critical thinking promoters, much of it couched for lay readers—making the book useful both as a refresher for some and an introduction for others. Penguin/Random House, 2021, 273 pp., $27.00.

—Kendrick Frazier and Benjamin Radford

Skeptical Inquirer
Environmentalism and the Fringe
David Mountain
Ten Years of Fukushima Disinformation
Distrust of Science
Top Ten Pro-Science Characters
Lynn Margulis and Our Symbiotic Cells
Why Earth Has to Be Old
Teens, Drugs, and Malarkey

Environmentalism and the Fringe

Re: "Environmentalism and the Fringe" by David Mountain (July/August 2021). One crucial and pragmatic solution to human-induced environmental degradation is to slow population growth through voluntary family planning. The UN projects world population will reach 9.4–10.1 billion in 2050—achieving the lower end of that range would help us preserve the natural world for future generations. One study found that slower population growth could achieve up to 41 percent of needed emissions reductions by 2050. Another determined that when combined with girls' education, family planning could prevent 85 gigatons of CO_2 emissions by 2050.

While per capita emissions in more developed countries must decrease, emissions in less developed countries—many of which have high-fertility, rapid population growth, and high unmet need for family planning—must increase to raise living standards. The only sustainable way to increase per capita emissions in less developed countries—where 99.8 percent of population growth between now and 2050 is projected to occur—is to simultaneously enable people to have smaller families.

Expanding access to family planning options facilitates women's empowerment and strengthens people's ability to adapt to environmental changes. When people have affordable access to high-quality, reliable contraceptives—and the education to use them effectively—they tend to have fewer, healthier children. This is a boon to both people and the planet.

Marian Starkey, MSc
VP for Communications
Population Connection
Washington, D.C.

Some of the points David Mountain brought up were interesting and held some resonance for me as a fifty-year radical atheist ecologist. But I have several bones to pick as well. As a population activist that entire time, I'd like to think that I have a well-tuned radar for what I and others call "human supremacy" and "human population denial."

Any talk of saving the planet, climate crisis, sustainability, alternative energy, etc., should begin and end with some dialog about the driving cause of all the problems—way too many apex techno predators on planet Earth, i.e., humans. Too much focus nowadays is on just climate change.

Let's face it: the climate crisis is only one of many symptoms of now eight billion of us here (our numbers have more than tripled since I was born in the mid-1950s). I argue that runaway population growth is something we all should have addressed all along, and it should have been front and center since the advent of modern environmentalism. Ironically, as the population bomb has continued ticking into the sixth mass extinction (solely caused by humans), there is less and less population dialog. Starting in the mid-1970s and ramping up since then, human overpopulation has become a taboo subject. The general populace—whether left or right, science-based or religious-based—are commonly quite ignorant or at least quiet on the subject. Most science and environmental books and magazines ignore it (your sister magazine *Free Inquiry* being a refreshing exception).

As environmentalists, it's our job to educate on the subject. It will require some science—and especially courage and passion.

Lyn Dessaux
Running Springs, California

Excellent article and well written. Whenever I read about environmental problems—global warming, pollution, extinctions, etc.—I want to shout that these are all just the *symptoms* of an underlying problem that is even worse. I mean, of course, *overpopulation*! Until that is solved, the others will never be. And yet this is rarely mentioned. It seems people are just trying to cure the symptoms, not the disease.

And there is a very simple cure: If everyone on the globe could agree that, by random lot, people would have only one child per every five couples, within about forty years or so, the world population would be reduced to 10 percent of what it is now. Imagine: one-tenth of CO_2, one-tenth of deforestation, and so on. Civilization would be saved. A goal of two children per couple worldwide would also work but much more slowly.

It is rare that an existential threat has so simple a solution. I am aware that getting everyone to agree would not be easy. But the collapse of civilization would be painful. I wish everyone would get behind that solution and keep pushing it.

Donald C. Dilworth
East Boothbay, Maine

On the whole, I liked David Mountain's essay "Environmentalism and the Fringe" for its good service in helping to pull environmentalism away from the brink. No good can come of an environmental movement steeped in woozy mysticism. However, there is still much work ahead. Environmentalism still needs rescue from what I can only describe as the threat of ideological dogmatism. All too often its acolytes gush forth pronouncements laying claim to full and uncontestable knowledge of the entirety of the complex works of nature, climate in particular. And that being seasoned with a boast of full insight to the pounding in of the last nail of what redemption would look like. Looming up is the risk of a dangerous hubris, yet another incarnation of the fatal conceit in fact.

J. A. Wroblewski
Vancouver, British Columbia, Canada

As an ideologically conservative skeptic, I'm disheartened by the ease with which the Marxist left is hijacking the skeptical movement in the same way it has hijacked others. I'm more disheartened by the weakness, cowardice, and fear of disapproval in skeptics themselves when facing woke thugs. I'm still more disheartened by the extreme difficulty leftist skeptics have in seeing their biases, let alone turning the tools of skepticism back on themselves. Thus, I'm encouraged to see two pieces in the July/August issue that confront aspects of leftist dogma: "Environmentalism and the Fringe" by David Mountain and "Ten Years of Fukushima Disinformation" by Amardeo Sarma and Anna Veronika Wendland.

The Alinskyite critical theory left, with its dismissal of logic and fact in favor of personal attack, is five orders of magnitude more of a threat to skepticism and civilization than Christianity or pseudoscience ever were. Which, by the way, makes me ask why we allocate so much effort and passion to a pathetic Christian remnant while we are all but mute about the far more present and vicious threat of militant Islam.

I do not share the authors' ritual genuflection to the presumptive well-meaningness of leftist activists. I think they are power-lusting bullies.

Norman Carlson
Busti, New York

The way all ideologies operate is to find a few individuals on the fringe and then pronounce this fringe as "typical" of a much larger movement. That is what this article does.

First, the author admits: "Our planet is in serious trouble. If humanity is to survive this century with any semblance of the quality of life enjoyed today, all of us need to act quickly to limit and reverse anthropogenic climate change and environmental destruction."

But then that dire message is buried, because the author's sole

focus is to dwell on examples he finds of overreactions from a very small wing on the extreme left throughout history.

My skepticism is: The problem of the planet's ecosystem under attack did not result from the likes of far-left hippies but instead from the extreme right while a complacent (but less ideological) majority sat back and allowed it.

The misdirection of this article to look for scapegoats from the far-left hippies is very troubling for those looking for an honest evaluation of how we got here and any science solutions.

Here is your test: If every extreme environmentalist got "on board" with moderate solutions to global warming, do you think the past and/or future damage to the planet's ecosystem would be materially less?

There wasn't even any exploration of this topic by this author, but the answer is of course not. The left fringe is a very small group. On the other side, there was a lot of big money to be made damaging the environment. It was the far-right fringe that employed even scientists to disseminate misinformation that global warming was not real or else had not been proven. This in turn provided a curtain of cognitive dissonance so the majority could comfortably ignore warnings by scientists.

Patricia L. Pinney
Fairfax, Virginia

David Mountain replies:

I'm grateful to Marian Starkey, Lyn Dessaux, and Donald Dilworth for bringing the subject of population growth to the conversation. I agree that it's a fundamental cause of so much of our environmental crisis, and I too am frustrated by the near-total silence on the subject by fellow environmentalists. I didn't discuss it in the article only because the intention there wasn't to identify the main causes of environmental destruction but to highlight the role that fringe thinking has played in environmentalism's development.

On that point, the issue of politics should be addressed. Two letters—from Norman Carlson and Patricia Pinney—appear to make the assumption that fringe environmentalism and "far-left" ideology are synonymous. This is untrue, and the article mentioned (although perhaps too briefly) how various right-wing thinkers and groups in pre-war Europe laid the foundations for much of today's environmental pseudoscience. Moreover, much of this contemporary pseudoscience, such as hostility toward GMOs, can be found among people of all political persuasions.

None of us are immune to unscientific thinking, regardless of our political preferences. Conversely, we should remember that people from across the political spectrum have worked to try and save our planet over the past century. If there is one issue that should rise above our political differences, the ongoing environmental crisis is surely it.

Fukushima and Nuclear Power

"Ten Years of Fukushima Disinformation" (July/August 2021) defends the choice of building nuclear power plants by describing the destruction caused as damage from a tsunami, not from a nuclear accident.

To combat global warming climate chaos, it is time to reduce using fossil fuels. I don't care how the Fukushima deaths are classified (by tsunami or nuclear failure). I do care about how to pick the most helpful way to combat global warming.

Surely a list of "for" and "against" can help compare the effects of options. Nuclear power plants don't seem to rank well as opposed to using sun, wind, or water power. These power sources already exist and are free.

Nuclear power plants (reasons against):

- most expensive to build and operate
- take longest time to construct
- create the most dangerous threats if damaged
- need huge amounts of water (a scarce resource) to cool
- discharge contaminated water back into the environment
- release constant small but dangerous contamination into the air
- vulnerable to harm from terrorists, earthquakes, and tsunamis
- cause long, severe environmental damage if they "fail"

These disadvantages (for nuclear power plants) are much greater than those of using wind, sun, or water power. Those power sources are far less destructive to the earth.

Martha E. Martin
Kahului, Hawaii

I've been following emailed information from the Nuclear Information and Resource Service (NIRS) since my daughters were working in Japan when the Fukushima earthquake struck. It provided the most and best information for me to understand what had happened and what the risks might have been for them. (Not too great, as it happened, because they were 250 miles south of Tokyo. Still, an unusual wind might have blown radioactive dust their way. We advised them that it would be okay to stay in Japan.)

Two risks of nuclear power keep me from supporting it:

A. The catastrophic consequences of a major malfunction, such as Fukushima almost was;

B. The problem of protecting generations and generations from the radioactive waste of nuclear power generation.

I have appreciated efforts SI has taken to report on this issue. We should all compare the costs and benefits fully and factually. And we should compare costs of one solution against the costs of the alternatives vs. some imaginary green-only baseline. I also think that articles should include how to use energy most efficiently and how we might do well enough with less energy. Not just "What's the best way to jump?" but "Maybe we shouldn't jump."

John Orr
Fullerton, California

Amardeo Sarma and Anna Veronika Wendland reply:

Our article did not address the best energy mix for decarbonization. However, the IPCC Special Report on Global Warming of 1.5°C *does. It is about using all low-carbon energy sources. Nuclear energy is a component of all four scenarios described to achieve this goal in the report besides wind, solar, hydro, CCS, and BECCS.*

We addressed some of the "reasons against" in our piece. Much could be said about the other vastly exaggerated side effects. Viewed objectively as in https://ourworldindata.org/safest-sources-of-energy, nuclear energy is comparable with solar and wind concerning greenhouse emissions and safety and is better than hydropower.

We do not think that we have the luxury of omitting any low-emission energy source. The choice will depend on the country and regional conditions. Some countries with suitable conditions such as Iceland have chosen a mix of hydropower and geothermal energy for almost all their electricity production.

The worst possible choice is closing nuclear power plants that may still be operated for decades, such as those in Germany or a few U.S. states. Germany, often seen as an energy-transition example to follow, is likely to increase greenhouse emissions by 47m tons of carbon dioxide this year. Germany emits several times as much carbon dioxide as nuclear France for its electricity production. Also, Germans pay almost twice as much. Reality refutes the narrative of the clean and cheap transition to solar and wind.

Solar and wind are also not simpler from the system point of view. They require a highly complex backup storage system to compensate for their fluctuation, much of which is still a fossil fuel—namely gas. Setting up a list of for and against is an excellent idea, and we suspect many will be surprised by the result.

Fiction's Top Science Characters

I truly enjoyed the article "Top Ten Pro-Science Fictional Characters" (July/August 2021). It brought back many enjoyable memories, particularly one from a superhero of mine not mentioned. I first learned about science in my childhood by watching the TV show

Craig Kennedy: Criminologist in the early 1950s. The show starred an impassioned Donald Woods as a chemistry professor from a prominent university. Working with the local police, he found himself using chemistry and forensic science to help them solve crimes.

Fred Reiss
Winchester, California

I was disappointed that Brian Dunning did not include Christopher, the protagonist and narrator of the best-selling prize-winning novel *The Curious Incident of the Dog in the Night-Time* (Doubleday, 2003), in his list of "top-ten pro-science fictional characters." Sherlock Holmes (who does appear on Dunning's list) is the teenager's hero. During the novel, Christopher, who has Asperger's syndrome, uses logic and the scientific method to unravel the twin mysteries of who killed the titular dog and what happened to his allegedly dead mother. Unlike some of the works involving the other characters on Dunning's list, this is not just a vehicle for an admirable pro-science character but a brilliant work of literature in its own right. I commend it to any SI readers who have not yet encountered it.

Ian Robinson
President Emeritus
Rationalist Society of Australia

My wife and I would like to add our voices to the cacophony we are *sure* you've heard nominating Mark Watney (from Andy Weir's *The Martian* played by Matt Damon in the movie) to the list of top ten pro-science fictional characters. His omission by Brian Dunning is remarkable! While Roy Hinkley (The Professor) stays stuck on a remote island with coconuts, water, fruit, and six other castaways, Mark Watney has to survive on Mars for months after his crew left him for dead.

Not only does Mark Watney have to use science to survive, but he also has use his science and engineering skills to establish communications with NASA, drive to a supply spaceship hundreds of kilometers from his location, and then use that spaceship to rejoin his crew, all while subsisting on home grown potatoes!

Bill Monroe
Reno, Nevada

Lynn Margulis

Stanley Rice's article "Lynn Margulis and the Great Convergence that Didn't Happen" (July/August 2021) deserves commendation. Its blend of personal reminiscence with the story and science of Lynn Margulis was very compelling and very well written. Just a treat of an article! Reading it, I felt like I was in the classroom of a master lecturer. Although I'd heard of symbiogenesis before, I had never heard of Margulis, and Rice's words made her research and personality come alive.

David Mihalyfy
Chicago, Illinois

A Bastion of Ideas

I wanted to take the time to thank Professor Lorence Collins for writing the article "A Christian Geologist Explains Why the Earth Cannot Be 6,000 Years Old" (July/August 2021). One of the reasons I am quite thankful for this magazine is that it remains a bastion where people of different beliefs can get together in the continued search for truth to freely discuss ideas, and I applaud the professor for writing to an audience that some would perceive as potentially hostile to his beliefs. Thank you for the article, Professor; it's a breath of fresh air to hear skeptical ideas and science-based thinking from a different background.

Jonathan Michael
Raleigh, North Carolina

Infant Simulator Dolls

As a former nonprofessional board member of several agencies dealing with early childhood issues, I recognize a question about the infant simulator doll studies that was apparently not asked—or at least not reported in Stephen Hupp's article "Teens These Days: Sex, Drugs, and Malarkey" (SI July/August 2021).

Accepting the evidence that the programs using infant simulator dolls are ineffective in discouraging teen pregnancy, I wonder if students taught to "care" for a doll subsequently become better parents when they have their own children. With child neglect and abuse an ongoing tragedy in our country, it would be useful to know if practice can make performance if not perfect, at least better.

Fred Eaton
Chandler, Arizona

Stephen Hupp replies:

It is reasonable to wonder if infant simulator dolls might have benefits beyond their original purpose. A large body of research shows that parenting behaviors can be changed through behavioral skills training that uses: 1) instructions about parenting skills, 2) modeling of skills, 3) live practice of skills, and 4) immediate expert feedback during the practice (this is also used as part of behavioral parent training). Infant simulator dolls are typically not used in this way. They especially don't involve immediate expert feedback. Even if they did, the instructional period would be occurring long before the desired parenting behaviors would be needed, making it unlikely that working with these dolls would promote behavior change down the road. Lastly, it's also reasonable to wonder if the use of infant simulator dolls could help teens develop neglectful parenting habits, as the consequences of neglecting the doll are fairly minimal.

This Pains Me

As a longtime science fiction fan, I always used to roll my eyes whenever Scottie would resolve an engineering problem on the *Enterprise* by recalibrating the warp drives. It told me the screenwriters didn't have a clue about the meaning of *calibrate*.

I was reminded of that by Harriet Hall's perplexity at the medical 0–10 pain scale: "I never know what to say," she writes (July/August 2021, p. 21). Neither does the faculty at the University of Wisconsin Medical School, where I serve as a standardized patient, simulating a wide variety of conditions so medical students can practice their interviewing skills on me. Half of them (parroting, I'm sure, what their professors have told them) use what I call the Alpha approach (I won't dignify it by calling it a standard), in which a 10 is "the worst pain you've ever experienced." In my case, having led a charmed life, that's no worse than a dislocated pinky finger, a nuisance but hardly a screamer. The other half use the Omega approach, where a 10 is "the worst pain you can imagine." Did I mention that I was a science fiction fan—an *imaginative* one? Compared to that Omega, nobody in all human history has gotten as high as a 1.

Of course, when playing my roles, I faithfully repeat the number I've been told to use, but I can't help thinking that, long term, this lack of consistency is a bad idea. Suppose a nurse takes a patient history using the Alpha approach and tells the doctor that the patient, with acute constipation, reports a pain of 8 or 9. The doctor, trained under Omega, tells a crash cart to stand by while she prepares a massive dose of morphine. And the reverse, resulting in under-treating somebody in excruciating agony, would be even worse. As George Bernard Shaw observed, "The single biggest problem in communication is the illusion that it has taken place."

I wish the medical community would get its act together and standardize the calibration of its pain scale.

Richard S. Russell
Madison, Wisconsin

Venezuelan Antiscience

If Gabriel Andrade in his July/August 2021 article "The 'Miraculous Drops of José Gregorio Hernández' in Venezuela" was correct about his

antiscience claims against the government of Venezuela, we would see a different sequence of events. The Venezuelan president's Carvativir announcement was three months before his rejection of accepting the AstraZeneca vaccine. (Besides the blood clotting concerns, there were issues at a vaccine manufacturing plant, so fears were not completely irrational.) Andrade claims Venezuela rejects Western medical research methods, but I read about phase trials and in vitro, mice, and clinical trials for Carvativir in 2020 and that Venezuela participated in vaccine trials for the Russian vaccine Sputnik V. Two days after media pushback on Maduro's exaggerated claims, he backtracked and said Carvativir was only a "complementary antiviral." When on April 6 the Biden administration said we would not donate vaccines to them, the Venezuelan government protested. President Maduro announced May 31 that the WHO will send the Johnson & Johnson vaccine. Although the U.S. Treasury Financial Sanctions allow sale of medicine, they have had a severe impact on Venezuela's commerce. For example, in June their payments to COVAX for the Johnson & Johnson and Novavax vaccines were temporarily blocked. It seems that Venezuela's use of vaccines from Russia, China, and Cuba is more because of ease of access and finances than a lack of critical thinking or nationalistic prejudices.

Loren Hintz
Chapel Hill, North Carolina

Gabriel Andrade, MD, replies:

In his letter, Mr. Hintz claims that "besides the blood clotting concerns [from the AstraZeneca vaccine] there were issues at a vaccine manufacturing plant, so fears were not completely irrational." In my original article, I acknowledged that these concerns were legitimate but that further evidence proved that it was still unreasonable to outright and indefinitely reject the AstraZeneca vaccine, as the Venezuelan government did. In fact, whereas most European nations quickly lifted the moratorium on AstraZeneca, Venezuela has not done so.

Hintz believes the Venezuelan government's decision to reject the AstraZeneca vaccine has nothing to do with nationalism. But President Maduro's own language in addressing this issue suggests otherwise. When announcing his decision to reject the AstraZeneca vaccine, Maduro continuously appealed to "vaccine sovereignty." I should clarify that "vaccine sovereignty" is a worthy goal if that implies locally producing effective vaccines; unfortunately, in Maduro's case, "vaccine sovereignty" rather implies rejecting effective vaccines simply because they come from nations that he perceives as imperialist.

Hintz also claims that "when on April 6 the Biden administration said [the United States] would not donate vaccines to them, the Venezuelan government protested," implying that the Venezuelan government is open to receiving aid and is therefore not motivated by nationalism. But Hintz fails to understand the political game that the Venezuelan government plays. Maduro's protests come only when he knows that the aid will not be delivered, so as to gain leverage in the international scene as an anti-imperialist crusader. When aid is actually offered, Maduro typically appeals to nationalism and rejects it. This is exactly what happened in 2019, when a coalition formed by Colombia, Brazil, the United States, and the Netherlands tried to deliver a convoy of humanitarian aid, and Maduro's government stopped it at the border. Maduro's own political mentor—the late Hugo Chávez—did a similar deed in 1999: in the midst of Venezuela's worst natural catastrophe in its history (the Vargas mudslide), Chávez rejected much-needed American humanitarian aid, also appealing to nationalist rhetoric.

Hintz refuses to believe that the Venezuelan government rejects Western medical research methods, because he "read about phase trials and in vitro, mice, and clinical trials for Carvativir." Contrary to what Hintz believes, if Venezuela were fully compliant with the rigors of scientific methodology, Carvativir would have never been promoted, not even as a "complementary antiviral," because evidence for its efficacy is nonexistent. Homeopathy and acupuncture enthusiasts can also appeal to mice and in vitro equipment, but that in no way guarantees the proper commitment to scientific methods.

Hintz should be made aware that Venezuela's socialist government has a long history of rejection of conventional scientific protocols. Hugo Chávez publicly embraced Argentinian mathematician Oscar Varsavsky's ideas that conventional science is driven by bourgeois interests and for that reason, revolutionary left-wing governments must pursue a science driven by proletarian ideology—which effectively amounts to rejecting the principles of Western medical research. Additionally, as part of this revolutionary crusade, Maduro's government dismantled the Venezuelan Institute of Scientific Research, an internationally hailed institution.

Finally, Hintz argues that "Venezuela's use of vaccines from Russia, China, and Cuba is more because of ease of access and finances than a lack of critical thinking or nationalistic prejudices." This may very well be true. But again, it is important not to lose sight of the larger political context. Russia, China, and Cuba have been continuously trumpeted over the years by the Maduro regime as key allies in his anti-imperialist stance. In any case, the acceptance of Russian, Chinese, or Cuban vaccines is not objectionable per se. The truly objectionable deed is to unreasonably reject the AstraZeneca vaccine and promote alternative medicine and magical thinking. While we may never know the real motivations for these decisions by the Venezuelan government, the larger context suggests that nationalism plays a big part.

A Matter of Fact

Surely ground is conceded to "alternative fact" merchants if those troubled by them unthinkingly allow the solecism "if a fact is true or not"? ("Government without Facts," a review of *A Lot of People Are Saying*, July/August 2021).

If something is not true, it is not a fact; an *untrue fact* is an oxymoron. While the prefix *oxy* may apply to those who utter one in jest, if it is used with no sense of irony then its suffix *moron* may color one's perception of the writer. I am astonished that the reviewer let this pass without comment.

If we wish to enlighten those who side with that proto-Trump character Humpty Dumpty in their endeavor to be the master and make words mean what they choose them to mean, then we ought not carelessly make words mean so many different things. Perhaps the erosion in the concept of facts feared by the authors is aided when we thoughtlessly conflate the meanings of *fact* and *untruth*?

Chris Oldman
Cheltenham, England

[FEEDBACK

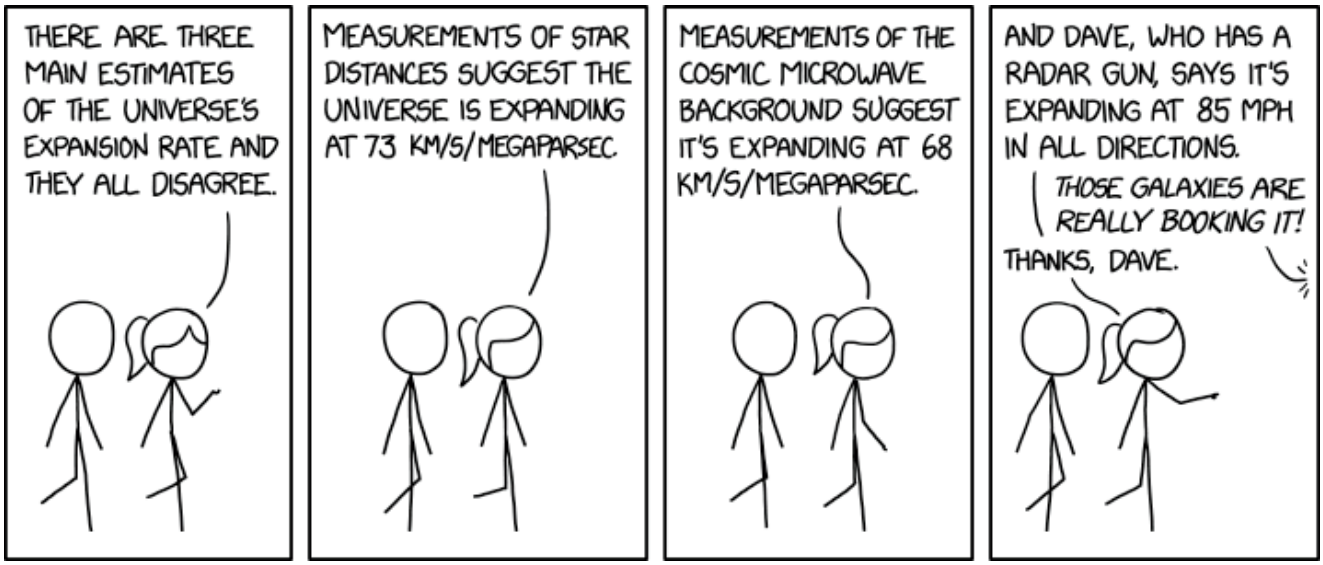
The letters column is a forum on matters raised in previous issues.

Letters should be no longer than 225 words.

Due to the volume of letters we receive, not all can be published. Send letters as email text (not attachments) to letters@skepticalinquirer.org. In the subject line, provide your surname and informative identification, e.g.: "Smith Letter on Jones evolution article." Include your name and address at the end of the letter. You may also mail your letter to the editor to 944 Deer Dr. NE, Albuquerque, NM 87122.

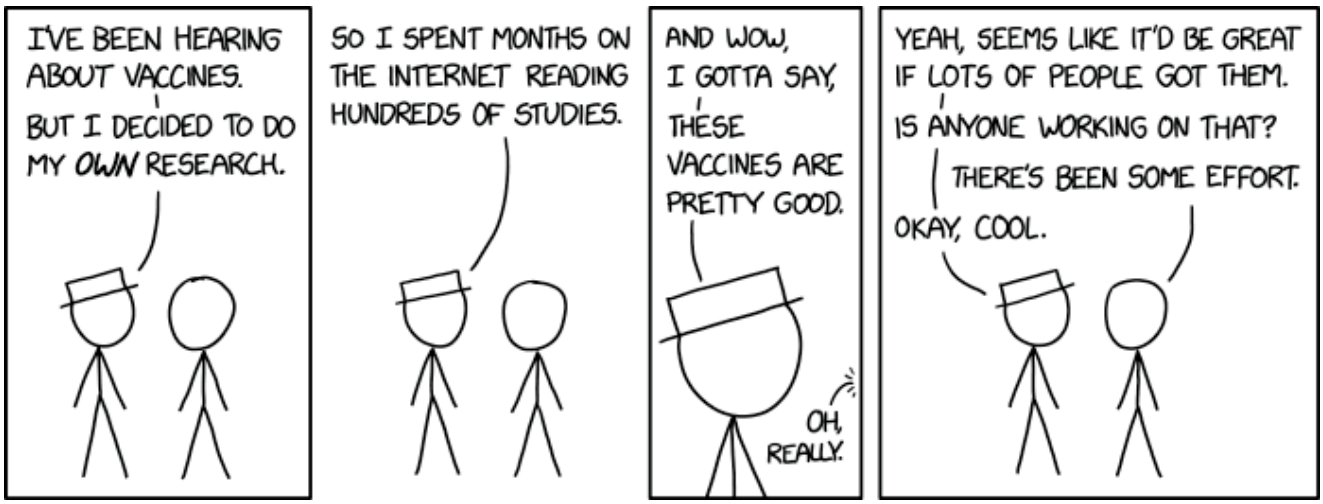
XKCD xkcd.com

Hubble Tension


THERE ARE THREE MAIN ESTIMATES OF THE UNIVERSE'S EXPANSION RATE AND THEY ALL DISAGREE.
MEASUREMENTS OF STAR DISTANCES SUGGEST THE UNIVERSE IS EXPANDING AT 73 KM/S/MEGAPARSEC.
MEASUREMENTS OF THE COSMIC MICROWAVE BACKGROUND SUGGEST IT'S EXPANDING AT 68 KM/S/MEGAPARSEC.
AND DAVE, WHO HAS A RADAR GUN, SAYS IT'S EXPANDING AT 85 MPH IN ALL DIRECTIONS.
THOSE GALAXIES ARE REALLY BOOKING IT!
THANKS, DAVE.

XKCD xkcd.com

Vaccine Research


I'VE BEEN HEARING ABOUT VACCINES.
BUT I DECIDED TO DO MY OWN RESEARCH.
SO I SPENT MONTHS ON THE INTERNET READING HUNDREDS OF STUDIES.
AND WOW, I GOTTA SAY, THESE VACCINES ARE PRETTY GOOD.
OH, REALLY.
YEAH, SEEMS LIKE IT'D BE GREAT IF LOTS OF PEOPLE GOT THEM.
IS ANYONE WORKING ON THAT?
THERE'S BEEN SOME EFFORT.
OKAY, COOL.

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